QST

January 1956
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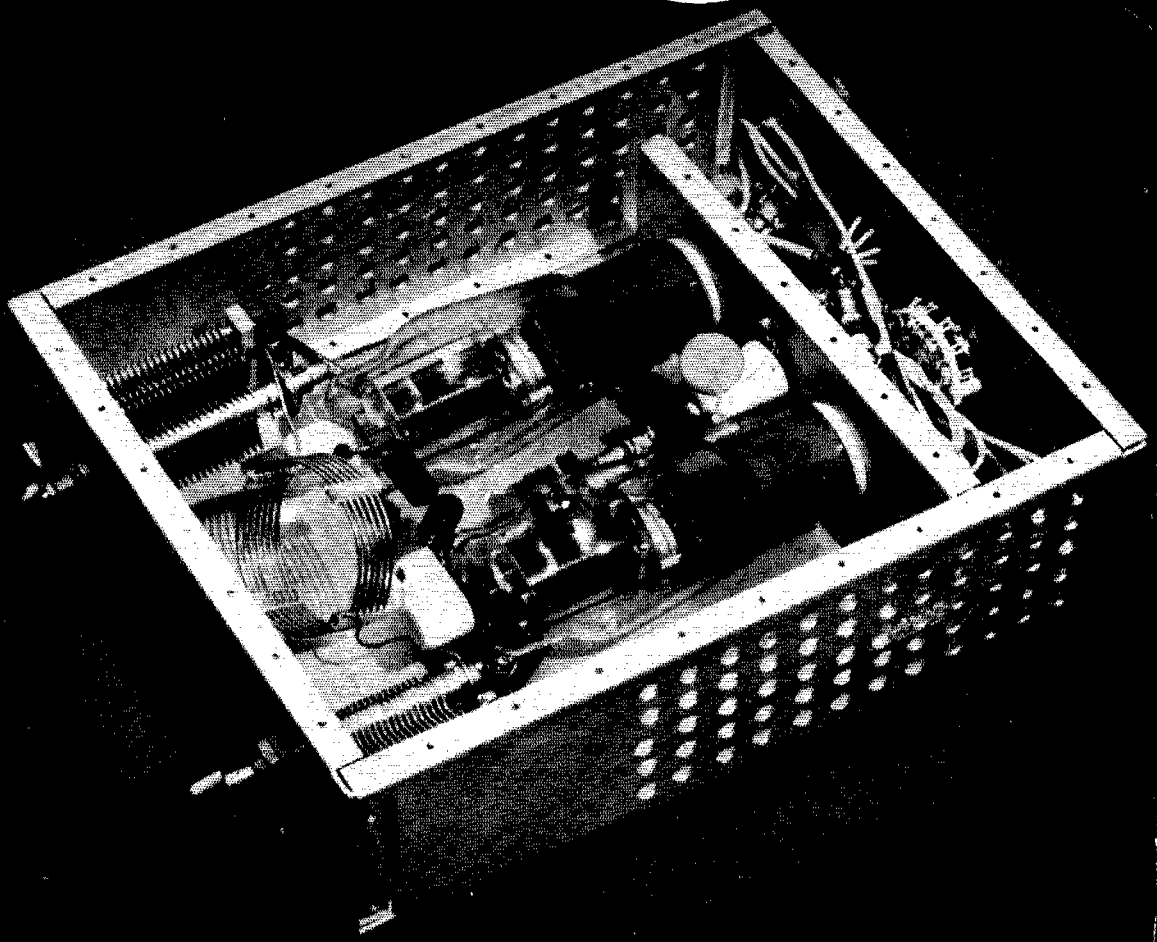
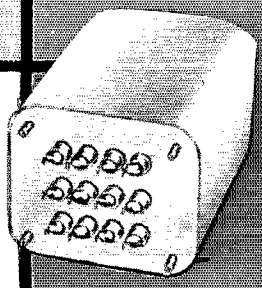


PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

NEW HERMETIC POWER COMPONENTS

HIGHEST RELIABILITY FOR MILITARY AND INDUSTRIAL USE



Listed below are just a few of the 50 new **stock items** in the United hermetic power series. These MIL-T-27 power components add to the 200 other hermetic stock items of filter, audio, and magnetic amplifier types. Through the use of proven new materials and design concepts, an unparalleled degree of life and reliability has been attained, considerably exceeding MIL-T-27 requirements. Test proved ratings are provided, not only for military applications but for **industrial, broadcast, and test equipment service (55°C. ambient).**

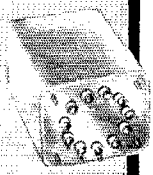
For complete listing of these new items, write for Catalogue #56.

MIL-T-27 RATINGS IN REGULAR TYPE — INDUSTRIAL RATINGS IN BOLD TYPE

TYPICAL POWER TRANSFORMERS, PRI: 115V., 50-60 cycles.

Type No.	HV Sec. C.T.	Approx* DC volts	DC MA	Fil. Wdg.	Approx* DC volts	MA DC	Fil. Wdg.	MIL Case
H-81	500	L 180	65		L 170	75		
		C 265	55	6.3VCT-3A	C 240	65	6.3VCT-3A	HA
	550	L 200	60	5V-2A	L 190	70	5V-2A	
		C 300	50		C 280	60		
H-84	700	L 255	170		L 240	210		
		C 400	110	6.3V-5A	C 360	150	6.3V-6A	KA
	750	L 275	160	6.3V-1A	L 260	200	6.3V-1.5A	
		C 420	105	5V-3A	C 380	140	5V-4A	
H-87	730	L 245	320		L 210	420		
		C 390	210	6.3V-6A	C 350	310	6.3V-6A	NB
	800	L 275	300	6.3V-2A	L 245	400	6.3V-2A	
		C 440	200	5V-4A	C 400	300	5V-4A	
H-93	1000	L 370	280	6.3V-8A	L 340	340	6.3V-10A	OA
	1200	L 465	250	6.3V-4A	L 455	300	6.3V-5A	
				5V-6A			5V-6A	

*After appropriate H series choke. L ratings are choke input filter, C ratings are condenser input.

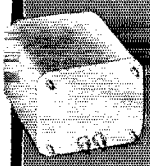


United "H" series power transformers are available in types suited to every electronic application. Proven ratings are listed for both high voltage outputs... condenser and choke input filter circuits... military and **industrial** applications.

A FEW TYPICAL LISTINGS OF FILTER REACTORS

Type No.	Ind. @ MA Hys.	DC	Ind. @ MA Hys.	DC	Ind. @ MA Hys.	DC	Ind. @ MA Hys.	DC	Res. Ohms	Max. DCV Ch. Input	Test V RMS	MIL Case
H-71	20	40	18.5	50	15.5	80	10	70	350	500	2500	FB
H-75	11	100	8.5	125	7.5	150	6.4	175	150	700	2500	HB
H-76	11	200	10	250	8.5	250	6.9	280	80	700	2500	KB
H-77	10	300	9	350	8	400	6.4	445	60	2000	3500	MB
H-78	7	800	6.5	900	6	1000	5.8	1250	20	3000	9000	SG7A

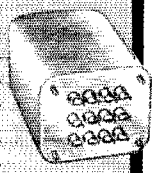
*Based on maximum ripple voltage across choke in choke input filter circuit, in terms of DC output voltage.



United "H" series filter reactors are extremely flexible in design and rating. Listings show actual inductance at four different values of DC. Bold type listings are **industrial** application maximums.

TYPICAL FILAMENT TRANSFORMERS, PRI: 105/115/210/220V., 50-60 cycles.

Type No.	Sec. Volts	Amps. (MIL)	Amps. (Ind)	Test Volts RMS	MIL Case
H-121	2.5	10	12	10000	JB
H-124	5	3	3	2000	FB
H-127	5	20	30	21000	NA
H-131	6.3CT	2	2.5	2500	FB
H-132	6.3CT	6	7	2500	JA
	6.3CT	6	7		
H-136	14, 12, 11CT	10	14	2500	LA

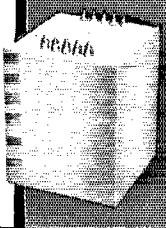


United "H" series filament transformers have multi-tapped primaries, good regulation, and are rated for **industrial** as well as military service.

TYPICAL PLATE TRANSFORMERS, PRI: 105/115/210/220V., 50-60 cycles.

No. Cycle	Sec. V. C.T.	Approx. DC volts	MA DC	Choke No.	MA DC	Choke No.	Case
H-110	1050	330	275	H-75	385	H-77	MB
	1200	465	350	H-76	350	H-77	
H-113	2800	1050	280	H-77	340	H-77	5¼ x 6 x 7
	3000	1275	250	H-78	300	H-78	
H-115	3500	1500	285	H-77	350	H-77	5¾ x 6½ x 8
	4400	1900	225	H-77	300	H-77	
H-117	5000	2125	300	H-78	1100	H-78	13½ x 11 x 14½
	6000	2850	300	H-78	1000	H-78	

*After filter choke. All ratings are for choke input filter.



United "H" series plate transformers incorporate dual high voltage ratings and tapped primaries to provide versatile units for a wide range of military and **industrial** electronic applications. Large units have terminals opposite mounting for typical transmitter use.

UNITED TRANSFORMER CO.

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W2CJO Supervises Final Testing of G-E Image Orthicons

Amateur background contributes to skill and knowledge needed for highly critical job

THE TV image seen by millions on tonight's hit program, will be clearer, more lifelike because Donald R. Roberts, W2CJO, helped assure top performance by G-E tubes in the studio cameras. Intricate to build, image orthicons get 16 final tests, visual and electrical. All are exacting.

Certain of these tests call for a knowledge of electronic principles as well as a mature understanding of camera-tube design and use. Here both Roberts and G.E. give credit to amateur experience as a source that provides background in practical electronics. "When I test image orthicons for microphonics," says Roberts, "the problem encountered is identical to one every ham wrestles with—except that the eye, not the ear, is affected."

A ham license-holder since 1941, Roberts is active on 2 meters, both phone and CW. Interest in electronics led to his first Schenectady job, as studio and transmitter technician with WRGB, pioneering TV station. Here he gained television experience that further aids him in his present camera-tube assignment.

Radio amateurs like W2CJO are found throughout G.E.'s 7 tube plants, doing key work in the design, production, and testing of transmitting, industrial, and receiving tubes of all types. Your General Electric distributor supplies you with quality tubes to which amateurs have made a direct and important contribution! *Tube Department, General Electric Co., Schenectady 5, N. Y.*

GENERAL ELECTRIC

166-181

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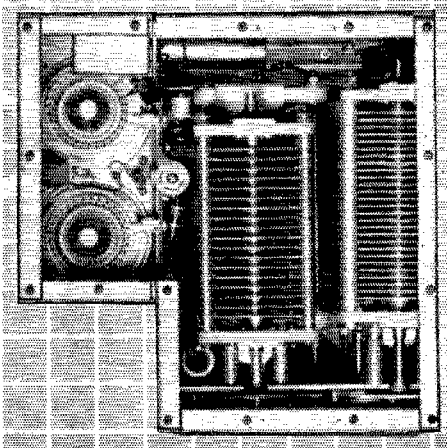
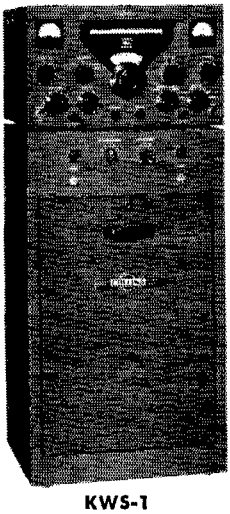


Collins KWS-1 SSB LINEAR

75A-4



KWS-1

The reputation for superior performance in the 75A-4 Receiver and KWS-1 Transmitter is no accident. Many problems were met and solved to give you this top Amateur team.

For example: Collins engineers wanted to design a *table-top* kilowatt SSB transmitter. In order to do this, they first had to design a superior linear amplifier in a small package. The result is the Collins KWS-1 linear — efficient, compact, with exceptionally low distortion.

FEATURES

- Inverse r-f feedback used to improve distortion generated in the PA and driver. Third order distortion products better than 35 db down.
- ALC (Automatic Load Control), a circuit similar to AVC in a receiver, prevents modulation peaks from driving the PA into distortion. This permits a high average percentage modulation.
- Bridge neutralizing circuit used to eliminate regeneration and instability.
- Two 4X250B tetrodes used in Class AB1 operation for optimum linearity and low drive requirements.
- Combination Pi-L output network results in excellent harmonic attenuation. This network is continuously tuned and requires no bandswitching.

For complete information and specifications plus price data, contact your nearest Collins distributor.

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

COLLINS

QST

JANUARY 1956

VOLUME XXXX • NUMBER 1

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

TEL.: AD 3-6268 TWX: HF 88

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—CONTENTS—

Barker & Williamson Presents
THE MODEL 5100-B
TRANSMITTER

holding the lead in amateur communications

The most outstanding feature of the new 5100-B transmitter is its *combination* of features. Unsurpassed performance on AM, CW, *and* SSB has been built into this one transmitter *without compromise.* Here, truly, is the transmitter of tomorrow . . . *today,* with:

- *high level AM telephony—push-to-talk*
- *clean CW keying—break-in on all bands*
- *superlative SSB — combined with the new 51SB-B*

Check *all* the features built into this fine transmitter. Write for literature, or see it at your distributor's. You may decide on the spot that the 5100-B is the transmitter of your dreams. *But you won't realize until you're on the air that words can't begin to describe the sparkling performance of this great transmitter.*

A FEW FEATURES OF THE 5100-B

Input power: 180 watts CW-SSB 140 watts AM phone
Frequency Control: Integral VFO or crystal
Operation: High level AM telephony—push-to-talk. Clean CW keying—break-in on all bands. Superlative SSB performance on all bands with the new 51SB-B generator
Controls: All controls on front panel. Fuse and high-low line voltage switch on rear chassis apron
Tuning: Ganged multiplier stage tuning
Styling: Handsome, distinctive blue-gray crackle cabinet. Semi-gloss gray silk-screened panel. Etched, machined aluminum knobs.
Coverage: 80-40-20-15-11-10 meters
Size: 22" wide x 11½" high x 14¾" deep
Weight: 88 pounds

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Unitized construction . . . pi-network final . . . integral low pass filter . . . TVI suppressed

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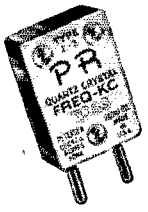

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Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, permanently sealed.....**$2.95 Net**

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Harmonic oscillator. Low drift. High activity. Can be keyed in most circuits. Stable as fundamental oscillators. Fine for doubling to 10 and 11 meters or "straight through" 20 meter operation.....**$3.95 Net**

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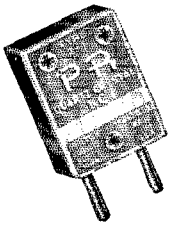

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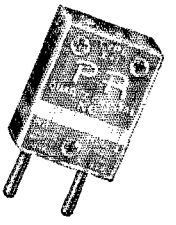

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Calibrated to .005%. 1500 to 10000 Kc. $3.95 Net

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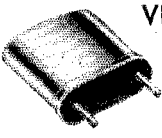

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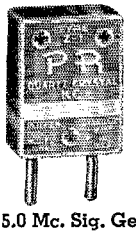

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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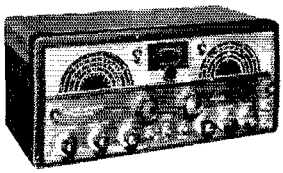
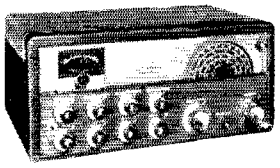
22 years experience guarantees the best in every price range



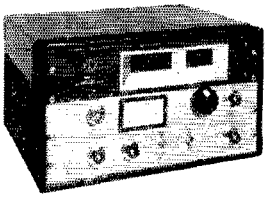
model SX-100
AM-CW-SSB
receiver
$295.00

"Tee-Notch" Filter provides a stable non-regenerative system for the rejection of unwanted heterodyne in SSB. The "Tee-Notch" also produces an effective steepening of the already excellent 50 mc i-f pass band. Upper or lower side band selectable by front panel switch. Notch depth control for maximum null adjustment. Antenna trimmer. Plug-in laboratory type evacuated 100 kc. quartz crystal calibrator—included in price. Second conversion oscillator crystal controlled—greater stability through crystal control and additional temperature compensation of high frequency oscillator circuits.



model HT-30
AM-CW-SSB
transmitter/
exciter
$495.00

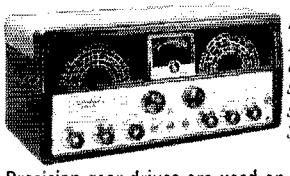
Built in V.F.O. reads directly in kilocycles. V.F.O. stability is equal to most crystals—.009%. There are also provisions for 1 crystal for fixed frequency operation. Selective filter system is same used by commercial communications companies for reliable sideband selection to assure continued suppression of unwanted side band energy (down 40 db or more) and distortion products. New 50 db range meter for constant monitoring of r-f output and carrier suppression. Voice control system built in with adjustable delay and anti-trip features. Front panel controls allow selection of AM, CW, and upper or lower side band.



model HT-31
AM-CW-SSB
linear power
amplifier
$395.00

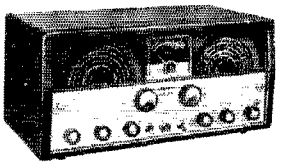
Continuous frequency coverage from 3.5 mc to 30 mc. Pi-network output for efficient harmonic and T.V.I. suppression. Major T.V.I. suppression built in. Does not require an antenna tuner as will feed loads from 50 to 600 ohms. Full metering of all important circuits, including input in watts. Employs two 811-A zero bias triodes in parallel. The input system is designed to be fed from a 50-70 ohm unbalanced line and requires a maximum of 10 watts drive on 80 meters. The grid tank circuit is balanced to provide all band neutralization.

hallicrafters
Chicago 24, Illinois



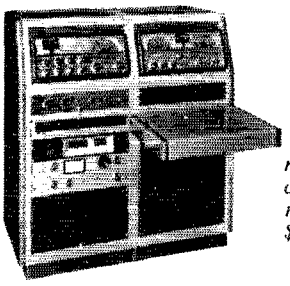
model SX-96
AM-CW-SSB
double conversion
selectable
side band receiver
$249.95

Precision gear drives are used on both main tuning and band spread dials. Double conversion with selectable crystal controlled second oscillators. Selectable side band reception of both suppressed carrier and full carrier transmissions by front panel switch, delayed AVC, CW operation with AVC on or off. Has calibrated bandspread. Double conversion superheterodyne over the entire frequency range. Automatic noise limiter operated from front panel. Carrier level indicator calibrated in "S" units from 1 to 9, decibels to 90 db over S9, microvolts from 1 to 1000 K.



model SX-99
AM-CW receiver
$149.95

Over 1000° of calibrated bandspread over the 10, 11, 15, 20, 40 and 80 meter amateur bands on easy-to-read dial. Separate bandspread tuning condenser, crystal filter, antenna trimmer, "S" meter, one r-f, two i-f stages and new styling. Complete front panel controls: antenna tuning, sensitivity, band selector, main tuning, bandspread tuning, volume, tone, standby, selectivity, crystal phasing, noise limiter.



model SR-500
complete amateur
radio station
$1495.00

A complete radio station in a handsome console cabinet—transmitter/exciter, linear power amplifier, receiver—affording the finest in V.F.O. or crystal. SSB, AM and CW transmission and reception. You need supply only the antenna, microphone and AC power. All the wiring is complete, and external connections are provided for antenna and microphone. A special communications speaker is positioned above the operating shelf. Console is mounted on casters. Three blank panels provide for installation of additional equipment.

THE AMERICAN RADIO RELAY LEAGUE, *INC.,*

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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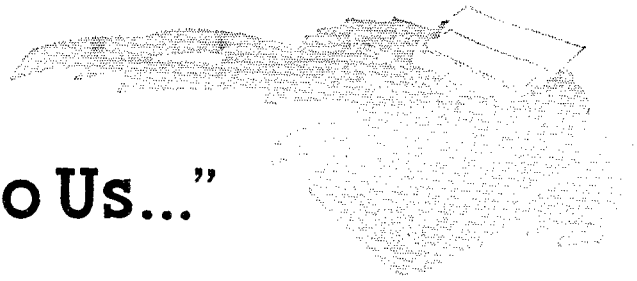


"It Seems to Us..."

THE YEAR IN REVIEW

Although this is written a month before year-end, it is customary in the January issue each year to review on this page, briefly, the progress of amateur radio and the League for the year just ending.

It is a pleasant duty to record, as we now have for some years past, that your League appears headed for new heights in membership and overall operations. Membership will be in the neighborhood of 50,000 for U. S. licensed amateurs, this reflecting the continued healthy growth of our hobby in this country. Business-wise, we expect our first million-dollar year in overall income. While this has been countered by new highs in our costs of operation, we nevertheless expect to show a modest net gain to sock away against the proverbial rainy day.

Regulation-wise, it was a quiet year, with only minor changes in our rules. Novices had their operating privileges extended by expansion of the 7 Mc. segment to include 7150–7200 kc. and Technician Class operators were authorized operation on 50-Mc., both changes coming as the result of requests to FCC from the League's Board of Directors. To comply with an earlier Executive Order, the Commission proposed a Conelrad program for amateurs; as the year ended these rules were adopted but, in line with a League request that initial observance be on a voluntary rather than a mandatory basis in order to give us time to develop appropriate methods of compliance, will not become effective until 1957. In another action, FCC amended our rules for the 420-Mc. band to enable easier compliance with the power-input specification. As a result of the success of the volunteer examination program, FCC found it feasible to reduce the number of examinations conducted in the field by cutting down the number of inspection visits to some cities; some other points, previously visited only once a year, have been dropped from the list. The Commission also clarified its rule on the transmission of spurious emissions in our telephony sub-bands; we have to stay inside the band limits whether the limit is at the end or "inside" an amateur band.

DXers expanded their country-list potentialities when Laos and Thailand withdrew their previous objections to their amateurs communicating with amateurs of other countries; XW and HS contacts are now legal.

Hundreds of calls were added to the list of those amateurs who, over the years, have provided essential emergency communications to their communities in times of disaster. Principally, this resulted from the floods and hurricanes which devastated the eastern and northeastern section of the country; here, as elsewhere in the past, innumerable instances of devotion to their fellow-citizens' interests added another glowing chapter to the public-service record of the amateur.

Recognition of the value of ham radio for blind persons was reflected in the issuance of a Novice Talking Book, a product of cooperation between ARRL and the Library of Congress. Interest continued high in call-letter license plates, the year-end tally showing thirty-two States, three U. S. possessions and one Canadian province now enjoying the privilege.

Technically, the year was one marked principally by refinement in our amateur gear. Most of the new receivers featured double conversion, practically mandatory in the continued search for better adjacent-channel selectivity and image rejection. Several designs incorporated a.v.c. for use in c.w. and s.s.b. reception. The increased use of "short beams" permitted many amateurs to erect beams where space limitations had made this type of antenna impossible. Mobile activity, on the increase for many years, has now become a standard part of amateur operation and *The Mobile Manual for Radio Amateurs* was added to our League's library. Increased interest in break-in with the same antenna encouraged the development of several designs of T-R boxes. Kits became a larger part of amateur radio than ever before, probably because they permit the builder to retain a degree of personal satisfaction in the assembly of his gear. Amateurs kept their eyes on transistor developments, and transistors found their way into a number of active low-powered transmitters on the 80- and 40-meter bands, as well as in test-equipment applications. Perhaps because of the greater use of band-switching transmitters, the search for better multiband antennas was intensified.

Perhaps the best news for most amateurs, both here and elsewhere, is that we have definitely turned toward the favorable part of the

sunspot cycle; DX conditions are slated to improve steadily for some years, now.

With licensing continuing at an encouraging rate, and interest in our hobby at an all-time high, the prospects for continued expansion and growth of amateur radio in 1956 appear as bright as old Sol!

HAMS AT HEADQUARTERS

●

W1AW, ARRL Headquarters Station

●

The following calls and personal sines belong to members of the Headquarters gang:

W1BDI	F. E. Handy, "fh"
W1BUD	A. L. Budlong, "bud"
W1CUT	E. Laird Campbell, "tex"
W1DF	George Grammer, "gg"
W1DX	Byron Goodman, "by"
W1FGF	Ronnie Gann, "ron"
WN1GTL	Vivian Rogers, "viv"
W1HDQ	E. P. Tilton, "ed"
W1ICP	L. G. McCoy, "lew"
W1JEQ	C. V. Chambers, "ve"
W1JMY	J. A. Moskey, "joe"
W1LVQ	John Huntoon, "jh"
W1NJM	George Hart, "geo"
W1QIS	Murray Powell, "mp"
W1RDV	Leland W. Aurick, "lee"
W1TS	D. H. Mix, "don"
W1UED	Perry Williams, "pw"
W1VG	L. A. Morrow, "pete"
W1WPO	R. L. White, "bob"
W1WPR	C. R. Bender, "cr"
W1WRJ	A. Murray Rommé, "mr"
W1YYM	Ellen White, "ln"
W1ZCS	Marie L. Page, "rie"
W1ZDP	Phil Simmons, "phil"
W1ZIB	Ann Furr, "ann"
W1ZID	Anne Welsh, "aw"
W1ZIM	Miriam Knapp, "kp"
W1ZJE	Lillian M. Salter, "lil"

Strays

Word comes to *QST* via the Sherry Frontenac Kibitzer, Miami Beach, Florida, that Donald H. McGeorge, W8NCE, and Dr. Robert S. Roscoe, W8FBD, are sponsoring plans to have the Jolly Boys Radio Club, of Cleveland, Ohio, conduct a meeting of the entire group in Miami Beach in June. Members of the Jolly Boys Club are W8AIU, Herbert Smith; W8DLJ, "Duke" Digby, W8EXM, Herbert Jackson; W8FBD, Robert Roscoe; W8FLK, "Gib" Rossiter; W8LJT, Elsworth Arnold; W8NCE, Donald McGeorge; W6OTC, Richard Froney; W8RYR, Joel Carpenter and W8WWB, Charles Ames.

OUR COVER

Unconventional construction and novel circuitry are features of W4YOT's "floating grid" amplifier. Your driver power goes right through to the antenna, in addition to that furnished by the amplifier itself. Shift your eyes to the next page and read all about it.

25 Years Ago this month

January 1931

. . . Obviously referring to ARRL's Technical Development Program, the Department of Commerce says that in 1930 "improved technical methods and apparatus devised particularly to meet the new conditions" permitted amateurs to continue successfully in the restricted wave bands imposed by the Washington Treaty.

. . . Radio Division Chief W. D. Terrell further reports that amateur station licenses reached a total of 18,994 in 1930; this is 2,165 more than a year ago, and the largest single year's growth since 1922. Editor Warner seizes these figures to chastise the prophets of doom who think the game is getting too complicated and the bands much too crowded.

. . . "A modern station specializing in 1750-kc. phone operation" is the label on a five-page description of Leon Faber's W9DAX in Sandwich, Ill. A pair of type '50 tubes modulate a single 852, driven by a series of 210 stages with crystal control, and powered by a mercury-arc rectifier system with "keep-alive" relay.

. . . "Revising Amateur Tuner Design" points out requirements for modern receivers. Aside from selectivity and sensitivity, author R. S. Kruse says the necessities include single-dial control, audio fidelity, and operation from a.c. lines rather than batteries.

. . . Operation of W1XP, key station in the ARRL Standard Frequency System, is described by M.I.T. Professor Howard A. Chinn. W1XP's signal is constantly monitored against amplified harmonics of the 100-kc. crystal standard in the lab, with the resultant audio beat relayed by landline back to the operating position.

. . . R.C.A. engineer A. Z. Smith, W1ABC-W2BIU, lists several dozen commercial stations of known frequency stability useful for frequency-meter calibration, but warns that others may "nonchalantly vary a couple of hundred kilocycles from day to day."

. . . Nearly 300 operators copied the Navy Day — 1930 — message to all amateurs transmitted by NAA, NPG and W1MK.

. . . A four-band "kitchen" transmitter described by Ed Glaser, W2BRB, is named from its location: under the gas range.

. . . Ross A. Hull has re-joined *QST*'s staff after a year and a half in his native Australia.

1956 NATIONAL CONVENTION

Things are shaping up fast for the National Convention later this year, and the dates have now been set. The big event is to be sponsored by the Convention Committee of the Central California Radio Clubs and is scheduled for July 6–7–8 with Headquarters at the Civic Auditorium and the Whitcomb Hotel in San Francisco. Now is the time to start saving and planning for that vacation trip this summer. Under the leadership of Clayt Bane, W6WB, the Committee promises a bang-up affair with prominent speakers and many interesting activities. More later.

A "Floating Grid" R.F. Amplifier

807s in Parallel with Cathode Drive

BY E. G. VON WALD,* W4YOT

• In a grounded-grid amplifier the amount of fed-through power is determined principally by the type of amplifier tube used. In the circuit described here, the feed-through is regulated by adjusting the drive on the control grid of a beam tetrode, resulting in an effect similar to changing the amplification factor.

WHEN you are considering going from lower to higher power, there is an intermediate region where an increase over your present power level represents a very questionable utilization of your available dollar supply, from the standpoint of money economy. This region is where the factor of increase is in the neighborhood of two to three.

For instance, if you have a fifty-watt transmitter, complete with self-contained modulator, it seems almost ludicrous to use its thirty-three-odd watts output to drive a pair of 807s. Even allowing a circuit loss factor of five, the new final will not require more than two watts of drive, so you are wasting over ninety per cent of the power you already have. And in addition to this you will need a new modulator, while the old one sits idle inside that beautiful exciter cabinet.

The amplifier described here approaches this special problem like they did it fifty years ago with bicycles. You simply run the present rig and the new amplifier into the antenna in tandem.

* South Dixie Highway, Lake Worth, Florida.

[1] Hoover, and Peck "A 200-Watt Grounded-Grid Linear Amplifier," *QST*, June, 1955.

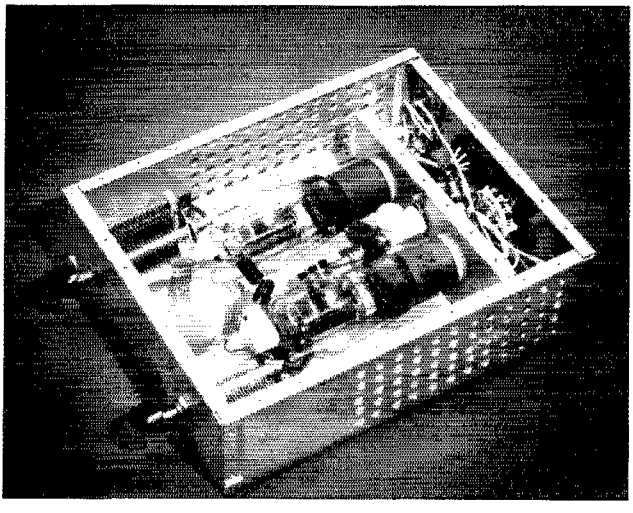
That may sound like one of Mr. Rapp's amusing little sophistries, but actually it is just another example of some of the interesting advantages of cathode-driven circuits pointed out in December, 1954, *QST*. For our present purposes, the most important of these advantages is the fact that the thirty-three watts of r.f. power we already have can be used to drive a pair of tetrodes in such a manner that most of the power is passed on through and is combined with the output of the new final, providing noticeable improvement in signal strength over that of the new amplifier alone.

The 807 seems to have its beam-forming plates connected to cathode inside the bulb, so cannot be altered as in the case of the 1625s described in June, 1955, *QST*.[1] Despite the relatively large feed-back capacitance thus provided, however, the cathode-driven circuit is sufficiently degenerative so that under anything approaching normal loading conditions, this amplifier is as stable as any other. It was designed to operate from the comparatively low plate voltage of 500, which happened to be available in a handy bench power supply. Heater current is supplied from the same source. All metering is done externally through suitable leads included in the power cable, so that the unit became relatively small and compact.

The Circuit

The amplifier uses two 807s in parallel as shown in Fig. 1. Circuitwise, 1625s no doubt would do just as well.

The r.f. input line is brought directly from the coax fitting to the 807 cathodes through a



The compact and rather unconventional construction gives complete shielding of the amplifier when the top cover (not shown) is in place. The cover is an aluminum sheet perforated for ventilation like the sides.

This amplifier covers the 7- and 14-Mc. bands with one coil in the pi-network tank.

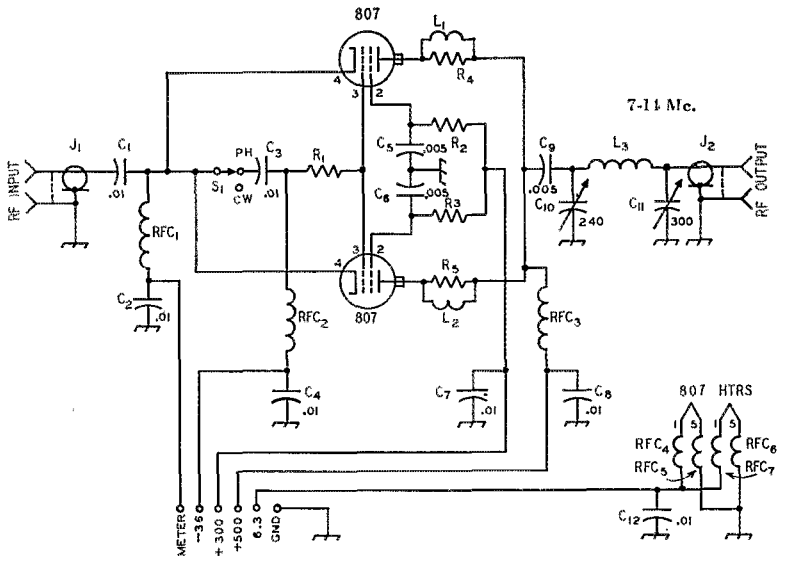


Fig. 1 — Circuit diagram of the parallel 807 "floating-grid" amplifier. Capacitances below 0.001 μf. are in μμf.

C_1–C_8, inc. — 600-volt ceramic.
C_9 — 2000-volt mica.
C_{10}, C_{11} — Variable.
C_{12} — Ceramic.
R_1 — 1000 ohms, 1-watt composition (see text).
R_2, R_3, R_4, R_5 — 270 ohms, 2-watt composition.
L_1, L_2 — 10 turns No. 20 wound on R_4 and R_5, respectively.
L_3 — For 7-14 Mc.: 6½ turns No. 16, 2-inch diam., 10 t.p.i. (B & W 3907-1).
J_1, J_2 — Coaxial connectors, chassis mounting.
RFC_1 — 1 mh. 200 ma., or two 2.5 mh. 100 ma. in parallel.
RFC_2 — Approx. 500 μh. (see text).
RFC_3 — 1 mh. 300 ma.
RFC_4–RFC_7, inc. — See text.

blocking condenser, C_1. D.c. returns to the cathodes are made through two standard 100-ma. r.f. chokes in parallel, leads from which go to the power socket for metering of cathode current. The necessary isolation of the heaters from ground is provided by homemade coaxial chokes wound on a piece of plastic tubing.

It will be noted that certain minor modifications in the usual grid circuit are made, to the extent that the control grids are not connected to ground for r.f. but rather "float" at a potential intermediate between ground and cathode. The principal reason for this is the desired objective of making all of the available exciter power contribute to the total output. The input impedance of two "grounded-grid" 807s in parallel is in the vicinity of 300 ohms; this means that to use the 33 watts drive available the r.f. voltage between cathode and ground would have to be about 100 volts. This is about 70 volts too much for 807s in Class B linear 'phone service, and 50-odd volts more than is necessary for them in Class C c.w. service. There are other ways to limit the r.f. voltage delivered to the control grids, but the method shown in the circuit diagram resulted in the best stability here. If the operating conditions or available drive vary appreciably from those listed, R_1 can be varied accordingly to compensate, but this probably will be necessary only for 'phone. On c.w., R_1 is used chiefly as a loading resistor to damp out low-frequency parasitics, and the value for this is not at all critical. External grid bias is required, and hearing-aid batteries make a convenient source of bias since they can be taped right on the back of the grid-current meter.

Everything else about the circuit is more or less conventional, including the pi-section output tank, which is designed for operation on two bands, 7 and 14 Mc., without switching.

Construction

The unit is built into a 3 × 8 × 10-inch aluminum chassis made up of Seezak expandable chassis parts, put together with self-tapping screws. As can be seen from the photographs, this permits the complete detachment of all pieces for maximum working ease. The front panel is a 3 × 8-inch chassis rail, with the two variable condensers, C_{10} and C_{11}, mounted as close to the ends as possible. Between them is the tank coil, soldered directly to the condenser terminals. A convenient space develops between the condensers and in front of the coil for later addition of a coil-shorting switch in case coverage of more bands is desired.

The two 807s are mounted on a partition made from a 3 × 8-inch chassis rail fastened to the base plate. The rail has an inch cut off its left end to afford clear passage for a high-voltage lead and a connection between the output condenser, C_{11}, and the output coax fitting on the rear panel. V.h.f. parasitic suppressors form connections between the plate caps and the plate blocking condenser, C_9, which is mounted along with the plate choke on a ceramic stand-off insulator between the tubes. The rear panel is another 3 × 8-inch chassis rail. It supports the

coax connectors, power plug and the ceramic 'phone-c.w. switch. Everything else is attached to the rear side of the partition, using tie-strips as necessary. The control grid isolating choke, RFC_2, was made from a defunct 2.5-mh. 100-ma. r.f. choke, and can best be described as being the one pie left intact after you break the ceramic core. Its value is not critical, so long as it is appreciably different from the chokes used elsewhere in the circuit, so it would be simpler by far to buy one.

The heater chokes are at the bottom of the partition near the base plate. These consist of four coaxial windings, one on top of the other, with friction-tape layer-separators. They are wound with No. 20 enameled wire and are 3 inches long on a 5/8-inch plastic tube. The tube should be cut about an inch longer than the windings so a mounting fitting can be fastened to it. Almost anything will serve for the fitting so long as it can be made tight and is of sufficient length to allow clearance around the choke for other components between it and the partition. The one used here was made up from Erector set angle pieces.

A plentiful supply of ventilation holes is drilled in the side rails and cover plate, because the two 807s have to dissipate around 60 watts when they are fully loaded up on 'phone.

Adjustment

Initial tune-up is no more complex than with the usual grounded-cathode amplifier, but it is a good idea to do it at half screen voltage, even though this tends to make reactions somewhat sluggish.

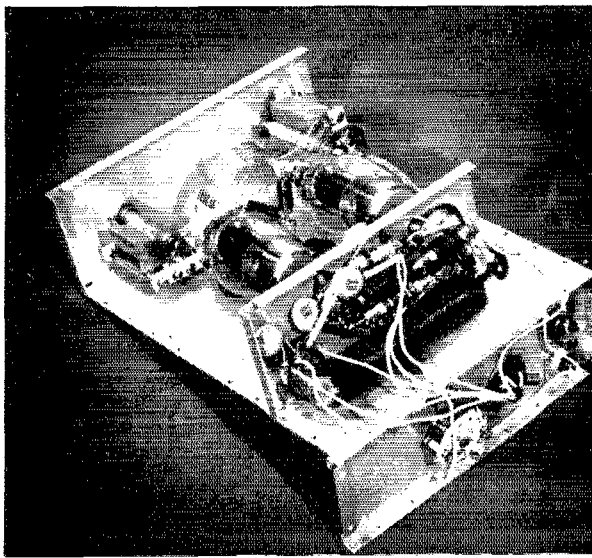
It will be found that the large degree of coupling between the cathodes and plates because of the presence of beam-forming plates in the 807s results in appreciable interaction between the tuning of the output tank and the loading on the exciter. Grid current also tends to vary widely as the plate condenser is turned through the region of resonance. All this merely means that the adjustments should be run through several times in order to familiarize yourself with what happens when you do something. A point to remember is that when there is appreciable coupling between the input and output circuits the peak output does not usually coincide with the lowest plate-current reading obtainable with a given degree of loading. Generally speaking, best results will be obtained if the plate current meter is used only to determine the general level of input power, and all tuning adjustments are made with an output indicator, tuning for maximum output. A neon bulb is a fairly satisfactory indicator, although an r.f. voltmeter of the germanium-diode variety is considerably more sensitive and is simple to make, since absolute accuracy is of no importance. When operating the amplifier as a linear on 'phone, the usual methods of oscilloscope measurement should be followed. These are described at length in The Book, so there is no need to go into them here.

The Results You Get

For c.w., you can simply add the input to the exciter to that of the amplifier, and figure your output from that as if the total were the input to a single amplifier. On 'phone, like any other linear, this amplifier runs at about half the efficiency for carrier level as it does for the carrier level on c.w., and you can only put about 90 watts into it under those circumstances. Of course, the exciter is still running at the efficiency it always did, and most of that power is coming right on through; therefore, for this mode of transmission, you can figure roughly that you are about doubling your power — providing you were running 45 or 50 watts input in the first place.

In other words, an amplifier such as this provides from three to five decibels gain over the original transmitter, depending on the type of emission. This is as much as you are ever likely to get from a two-or three-element beam of the "loaded" variety, and on the forty- and twenty-meter bands it is vastly simpler to build. Of course, you can't turn it sideways and keep the kilowatt down the street from blocking your receiver, as you could with a beam. Still, with the equivalent of 150 watts on c.w. and a pretty good antenna, such as a well-installed 16-foot top-loaded vertical on forty meters, you can work just about everything you can hear. What you can hear depends largely upon the receiver you have, and your skill at operating it.

Only Mr. Rapp can tell you how to work the ones you can't hear.



This view with the rear panel dropped down shows the socket wiring and heater choke assembly.

The 50-Mc. transmitter and its f.m. modulator mount on a single 7-inch rack panel. The r.f. section of the rig is at the right.

A TVI Special for 50 Mc.

90-Watts Input, with All TVI-Prevention Features

BY MASON P. SOUTHWORTH,* W1VLH

THE summer of 1955 was one of the best ever in 6-meter history. Activity reached a new high in most sections of the country. Opening the band to Technician Class licensees not only brought many newcomers to the band but it served to rekindle the interest of many an old-timer who had wandered to other fields. Not a few newcomers are halfway or farther along the road to a 50-Mc. WAS, after their first summer on the band.

Unfortunately, not everything was sweetness and light; the old bogeyman, Channel 2, reared his head in several areas. Admittedly, licking Channel 2 TVI from 50 Mc. is no simple matter, but something *can* be done about it. W2IDZ has given us many of the answers, and his prize-winning *QST* article [1] should be required reading for prospective 6-meter men in Channel 2 areas. TVI problems that arise in connection with other channels have also had extensive treatment in *QST* [2] and the *Handbook*. The purpose of this article is to describe a simple but effective 50-Mc. transmitter employing techniques that will put the solution of the TVI problem squarely on the receiver if interference does show up. Only when the transmitter is completely "clean" can we be sure that receiver filters and/or traps will accomplish the desired end.

For those interested in results, we offer evidence taken at W1HDQ, Canton, Conn. The rig was operated on the low end of the 50-Mc. band with the open-wire feed line to the 6-meter beam only inches away from a conical TV array being used to pick up the marginal signal of WCBS, Channel 2, from New York City. The TV receiver was equipped with a W2IDZ filter[1] and there was a sheet of aluminum screen wire under the chassis, to prevent direct pick-up by the receiver circuitry. The transmitter described produced practically no interference in the grey and snowy picture. Another rig that is built according to accepted TVI-prevention methods, except that it employs 6- or 8-Mc. crystals, obliterated the picture under the same operating conditions. It thus appears that much of our TVI trouble in Channel 2 attributed to poor adjacent channel selectivity in the TV set may actually have resulted from radiation of small amounts of power in the TV channel.

Design Features

Two things distinguish this 6-meter rig from others we have described in the past. First, all of its stages are on the operating frequency, eliminating the possibility of radiating unwanted crystal oscillator or exciter harmonics that fall in the lower TV channels. Second, it has a simple form of f.m., for use in areas where audio-type interference may be a problem. Two of the most common sources of 50-Mc. TVI are thus eliminated.

We have tended to avoid the straight-through-on-50-Mc. approach heretofore, as crystals for direct control on 50 Mc. have been expensive and tricky to use. Techniques for the production and use of v.h.f. crystals have improved markedly in recent years, however, and we find that overtone crystals for use up to 70 Mc. or more are now available from most manufacturers at moderate cost. They are reasonably stable, and they require nothing special in the way of circuits.

In this rig the triode portion of a 6U8 is used as the crystal oscillator. The crystal is an International Crystal Mfg. Co. type FA-9, in the simple triode circuit recommended by that manufacturer. Note that no feed-back is necessary, other than that through the tube capacitance. The pentode half of the 6U8 is a buffer-amplifier that builds the output to the level required for

* Laboratory Assistant, *QST*.

[1] Ladd, "50-Mc. TVI — Its Causes and Cures," *QST*, June and July, 1954.

[2] Tilton, "TVI Hints for the V.H.F. Man," *QST*, April, 1953, p. 16. Also 1954 and later *Handbooks*.

driving the 6146 final amplifier. No neutralization is needed in the pentode driver stage, but a shield isolating the grid and plate circuits was found to be necessary.

The final stage may be operated at up to 67 watts with amplitude modulation, or up to 90 watts input for c.w. or f.m. Capacity bridge neutralization is used to stabilize this stage. The output coupling circuit has a small trap in the lead to the coaxial output fitting. This may be tuned to Channel 11, 12 or 13 (depending on the operating frequency) to attenuate fourth-harmonic output that might otherwise cause TVI in these channels. This one precaution, plus the customary shielding of the r.f. section and careful filtering of the power leads, practically eliminates harmonic TVI.

The only other type of TVI that can be prevented at the transmitter is that resulting from r.f. pick-up by the audio circuits of the TV receiver. This is a receiver weakness, but the trouble can be prevented if we use c.w. or frequency modulation. High-level amplitude modulation is undoubtedly the most effective means of communicating on the v.h.f. bands by voice, with the receivers currently used, but it can cause plenty of trouble in a crowded neighborhood. If you can use plate modulation without upsetting neighborhood peace, we recommend that you do so, but if you have to go to f.m., this rig provides a simple way to handle the modulation problem.

In working with the 50-Mc. crystal oscillator it was found that varying the plate voltage caused the oscillator frequency to swing in a fairly linear manner. This suggested the possibility of applying an audio voltage to the oscillator plate supply to provide frequency swing, and then relying on the following two Class C stages to wipe out any resultant amplitude modulation. The method was tried and found to be quite usable. It is not the best f.m. system in the world,[3] but it certainly is one of the simplest. A 6AU6 speech amplifier, with crystal microphone input, is resistance coupled to a 6AQ5 or 6AK6 modulator. An inexpensive audio choke is used in place of a modulation transformer, as only a small percentage of modulation is needed to produce sufficient deviation for good audio recovery where selective receivers are used.

[3] A more effective approach to narrow-band f.m. may be found in *QST* for August, 1954, p. 39.

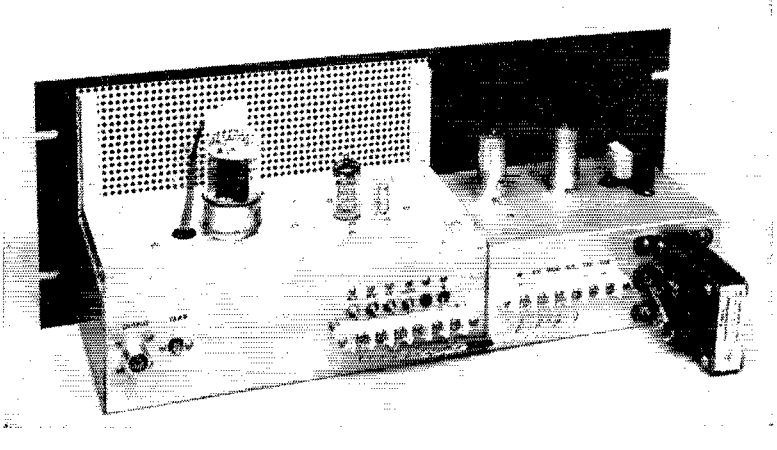
Layout and Construction

The various photographs show how the r.f. and audio sections are built as separate units and mounted on a common 7 × 19-inch rack panel. Either section can, of course, be built separately for use with other equipment if so desired. A 5 × 10 × 3-inch aluminum chassis is employed for the r.f. section while a 5 × 7 × 3-inch unit serves for the modulator. The enclosure for the r.f. section is made from perforated aluminum sheet and ½-inch aluminum angle. Any other type of enclosure combining shielding with ventilation will be equally good.

On the left side of the panel (front view) are seen the heater switch, gain control and microphone jack. These are in the audio unit. Continuing to the right on the panel we see the oscillator and buffer tuning controls and jacks for measuring amplifier grid and cathode current. The cathode circuit jack is also used for c.w. keying. Following these are the amplifier tuning and output link capacitors. The National chart frame mounted above the controls provides a space for logging control settings.

For rack mounting the two chassis are bolted together and held to the panel by the nuts on the various control shafts.

In the rear view the coaxial output connector and 200-Mc. trap tuning capacitor are visible at the extreme left. The 6146, 6U8, and crystal are on top of the r.f. section chassis. Note the ¼-inch copper strap used for the 6146 plate lead. A strap of this sort is preferable to the braid or stranded wire often used for plate leads. The terminal strip for power connections is mounted on ½-inch spacers on the rear wall of the chassis. A six-terminal strip is shown, but only five connections are needed. The filament and plate voltage leads are brought out on feed-through capacitors, with the outside ends of their conductors soldered to terminals on the strip. Over on the audio chassis, the speech amplifier and



Rear view of the 50-Mc. transmitter with shield cover removed from the r.f. portion.

modulator tubes and audio choke are seen from left to right on top of the chassis. The power connections and 6.3-volt transformer are on the back. The transformer provides for all heaters, but it may be omitted if heater voltage is available from some other source. A 6AK6 modulator tube is shown in the photographs. A 6AQ5 was later tried and found to be equally satisfactory. The latter is slightly less expensive and is the one shown in the schematic diagram.

Two bottom views are shown to make all details of the r.f. section clear. Most of the wiring in the audio section at the left consists of mounting the various resistors and capacitors. The filament wiring, and the microphone and gain control leads should be shielded to cut down hum and r.f. pick-up. Over in the r.f. section we see the flashing copper shield across the 6U8 tube socket. Its purpose is to isolate Pins 2 and 6 and the oscillator and buffer tuned circuits. The socket should be mounted with Pins 1 and 9 toward the rear of the chassis. The shield is mounted by bolting its bent-over flange to the chassis. It should also be soldered to the small cylindrical shield in the center of the socket. A tie point, not visible in the photograph, supports the ground end of the oscillator coil.

The buffer tuned circuit is to the right of the shield. Heavy wire such as No. 14 should be used for the plate to capacitor lead in this stage as well as the oscillator. The 6146 socket is mounted with its keyway toward the right. Note that the three cathode terminals are by-passed individually, with as short leads as possible. The plate coil and link are to the right of the socket. The neutralizing trimmer is soldered to the stator terminal of the plate tuning capacitor and its sleeve is connected with a length of heavy wire to a tie point supporting the cold end of the amplifier grid coil. Other tie points are used where necessary to support the by-passed ends of the buffer resistors. All the panel tuning capacitors should be the shaft mounted type, for complete shielding. Power wiring is all done with shielded wire.

A close-up view of the bottom of the r.f. section is provided to show clearly the components mounted on the rear wall. To the left are the power

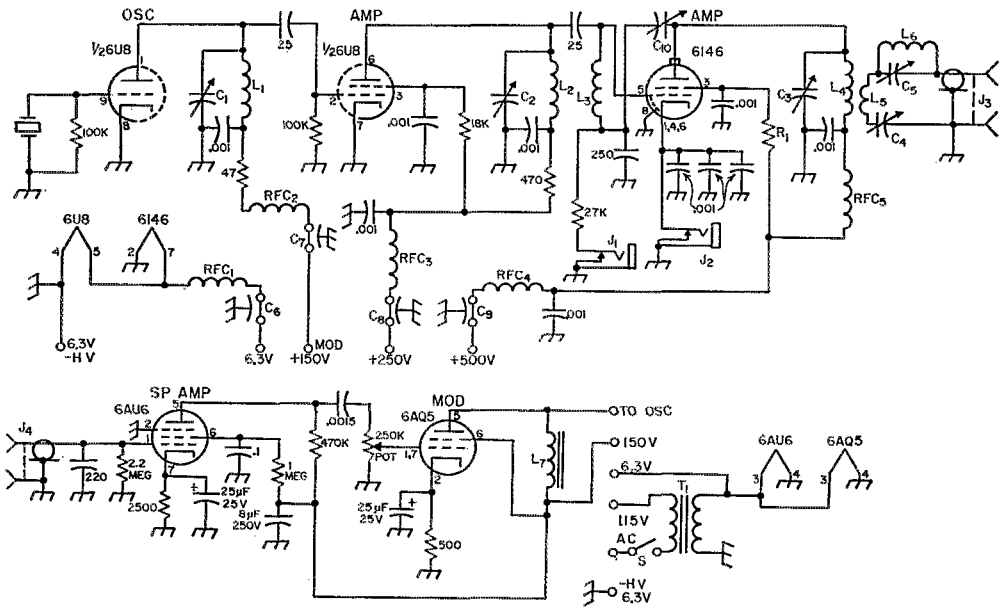


Fig. 1 — Schematic diagram and parts information for the 50-Mc. transmitter. Capacitor values below .001 are in μμf.; resistors ½ watt unless specified.

C_1, C_2 — 15-μμf. variable, shaft-mount type (Hammarlund HF-15).

C_3 — Same as C_1, but double spaced (Hammarlund HF-15X).

C_4 — 50-μμf. variable, shaft-mount type (Hammarlund HF-50).

C_5 — 15-μμf. trimmer (Hammarlund APC-15).

C_6, C_7, C_8, C_9 — 500-μμf. feed-through by-pass (Centralab FT-500).

C_{10} — 8-μμf. tubular trimmer (Erie 532–10).

R_1 — 33,000 ohms, 3 watts (three 100,000-ohm 1-watt resistors in parallel).

L_1 — 5 turns No. 20 tinned, ⅝-inch diam., ⅝ inch long (B & W Miniductor No. 3007).

L_2 — 7½ turns similar to L_1, ½ inch long.

L_3 — 5½ turns similar to L_1. Mount L_2 and L_3 1¾ inches apart center to center, as seen in bottom-view photograph.

L_4 — 3½ turns No. 20 tinned, ¾-inch diam., ½ inch long (B & W No. 3010).

L_5 — 4 turns No. 20 tinned, ½-inch diam., ¼ inch long. Insert in cold end of L_4, half of length. (B & W No. 3003).

L_6 — 2 turns No. 20 tinned, ¼-inch diam., ⅛ inch long.

L_7 — Miniature filter choke.

J_1, J_2 — Closed-circuit jack.

J_3 — Coaxial chassis fitting (Amphenol 83-1R).

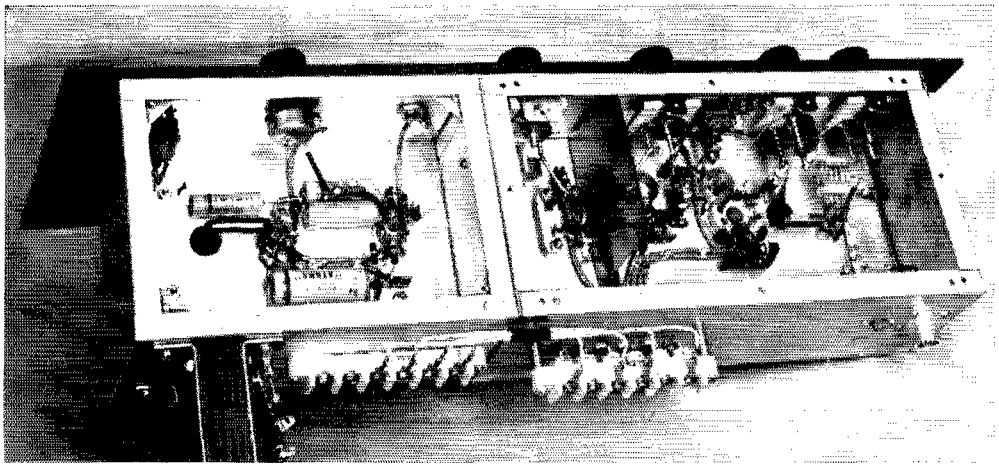
J_4 — Microphone fitting (Amphenol 75-PC1M).

RFC_1 – $_4$ — 14 inches No. 24 enam. wire close-wound on 5/16-inch form or resistor (Ohmite Z-235).

RFC_5 — 50-Mc. r.f. choke, 6.8 μh. (Ohmite Z-50).

S — S.p.s.t. toggle switch.

T_1 — 6.3-volt 3-amp. filament transformer.



Bottom view of the transmitter, with r.f. section cover removed.

connections. A single terminal tie point is adjacent to each feed-through capacitor. R.f. chokes are mounted between the capacitors and these tie points. In addition, the leads are by-passed at the tie points with disk ceramic capacitors. This is omitted in the case of the oscillator plate lead to prevent excessive by-passing of high audio frequencies. The primary purpose of this lead filtering is to prevent radiation of the fourth harmonic by power leads. It may be omitted if TVI is not expected to be a severe problem.

At the right end of the chassis is the 200-Mc. trap circuit. The coil is soldered right across the tuning capacitor, which must be a type having its rotor insulated from the chassis. This parallel circuit is connected in series with the short length of RG-58/U from the link to the output connector.

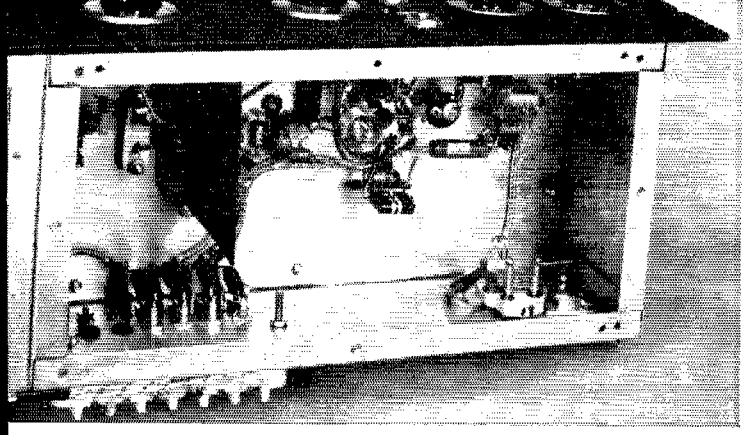
For those interested in building an exact duplicate of the original, more information on parts placement may be helpful. All the panel controls are centered vertically on the two three-inch high chassis, and the two metering jacks are 1½ inches apart. The filament switch is one inch from the end of its chassis, and the gain control and microphone jack are 2½ and 5 inches, respectively, from the switch. The oscillator and buffer capacitors, meter jacks, and amplifier and loading controls are located 1½, 4½, 6, 7½, and 9¼ inches, respectively, from the left end of the r.f. chassis. The various tubes, the crystal socket, and the choke are all on a line 2 inches back from the front of the chassis. The choke, 6AQ5, and 6AU6 are 1¼, 3½, and 5¾ inches from the left end of the modulator; while the crystal socket, 6U8, and 6146 are 2, 3, and 6 inches from the left end of the r.f. section.

It might be well to say a word or two about some of the other forms in which this rig can be constructed. If your equipment is not rack mounted, the two units need not be fastened together, and the modulator could be tucked away out of sight if desired. If amplitude modulation is to be employed, of course, the modulator described here can be dispensed with entirely. The modulator, in that case, should be capable of about 35 watts output. Neither unit represents the extreme in compactness, and the modulator especially could be built on a smaller chassis. The open layout used here is much more of a pleasure to wire and adjust, however, and is recommended. One point that some may wish to change is the placement of the crystal socket. It could be mounted on the front panel for easy QSY if you desire. This would permit the rig to be used as a driver for a 144-Mc. tripler, by the insertion of a 48-Mc. crystal and retuning the stages.

Adjustment and Operation

The first step in getting the rig working is to provide a suitable power supply. For best operation, three voltages are required but they can be furnished by two supplies or even one. The oscillator is most stable with a regulated voltage of 150, and this will do for the modulator as well. The buffer stage delivers the desired output with about 250 volts and a potential of 400 to 600 can be used for the amplifier, depending on the input desired. A convenient arrangement is to obtain the two lower voltages with a single 250-volt supply and VR tube. Total drain here will be about 50 ma. The amplifier will draw about 100 and 135 ma. with 400 and 500 volts, respectively, yielding inputs of 40 and 67 watts. The r.f. outputs for these conditions were found to be about 22 and 37 watts. The 67-watt input is maximum for amplitude modulation but up to 90 watts may be run with a plate voltage of 600, if only c.w. and f.m. are used.

When the power-supply question has been settled it is time to fire up the rig. Check out the r.f. section first. Apply filament voltage and then connect the 150-volt source through a milliammeter (0–25 ma. or so) to the oscillator terminal. Tune the oscillator capacitor for a dip. Current should be about 10 ma. Turn the plate voltage off and on several times to be sure that the



Close-up of the bottom of the 50-Mc. r.f. section, showing the r.f. decoupling circuits in the power leads, lower left. The fourth-harmonic trap may be seen at the lower right.

oscillator starts readily. If it should not, detune the plate circuit slightly until it does. Now apply about 250 volts to the buffer stage. This may be tuned for maximum 6146 grid current which is measured in the jack provided. At least 2 ma. should be obtained.

Now connect the high-voltage supply to the 6146. It might be well to start with no more than about 300 volts until proper operation is obtained. Be sure to connect a lamp or other load to the output before applying plate voltage. A 40-watt bulb will do, but since lamps are rather poor loads at this frequency, don't go too much by its brightness, or by the tuning of the series capacitor it requires. Tune the plate capacitor for a dip in cathode or plate current as indicated by a meter in the cathode jack or in series with the power supply. If a lamp load is used, it should light, indicating output. Tune the loading capacitor for maximum brilliance and then recheck the plate tuning.

The next job is neutralization of the amplifier. This is accomplished by adjusting the plastic tubular capacitor, C_{10}, which controls the feedback. It should be set so that when the plate capacitor is tuned through resonance, with no plate voltage on, there is no change in grid current. Minimum plate current and maximum grid current should occur at the same setting when the final is operated with plate voltage applied. If exact coincidence is not possible, make them come as close together as you can. Neutralization can be checked by pulling out the crystal momentarily. Amplifier grid current and output should drop to zero. If they do not, check the neutralization again. It is possible that some variations in layout may throw the neutralizing point outside the range of the plastic trimmer. If the amplifier is most stable with the trimmer at maximum, try a smaller grid coil by-pass than the 250-$\mu\mu$f. value shown.

That's about all there is to making the r.f. section work except for adjusting the 200-Mc. trap circuit. This may be set approximately with a grid dipper. Final adjustment should be made for minimum interference while watching a TV receiver tuned to Channel 11, 12 or 13, depending on the operating frequency.

Now connect the 150-volt supply to the audio unit and the output of the modulator to the oscillator connection. The f.m. can be checked by listening to it on the station receiver. Plate voltage need not be applied to the 6146 while this is done. Turn up the gain control until the audio sounds loud, but not far enough so that excessive distortion and sideband splatter are present. This setting should do to start with and it can be modified according to reports from on-the-air checks. You will find that some adjustment of the deviation may be necessary when working stations having receivers with exceptionally wide or narrow i.f. systems. In general, however, a setting can be found which will hold for most work.

Well, that should take care of the adjustment procedure. Suitable 6-meter antennas are described in the V.H.F. Antenna chapters of all recent *Handbooks*. A 52- or 72-ohm transmission line can be connected to the rig directly and open-wire line or ribbon can be connected through a balun. The amplifier plate tuning capacitor can be tuned for the dip, but some form of output indicator or field-strength meter is helpful in adjusting the link tuning. This will insure getting the most output from the transmitter.

Its output is quite sufficient for a respectable 50-Mc. signal, and you will have the satisfaction of knowing that if TVI does show up it will almost certainly be as a result of receiver deficiences of one sort or another.

It should be noted that the shielding, the filtering of the power leads and the use of f.m. are precautions that need be taken only if the TVI threat is a severe one. There are still many locations around the country where a rig like this could be used with amplitude modulation of the final, and without the shielding and filtering in the complete form described here. Just the use of the 50-Mc. crystal is sufficient to solve the TVI problems that plague many v.h.f. operators. If yours is a crowded neighborhood in a Channel 2 area you'll need to go all the way, but if you are blessed with a home in the wide open spaces (and away from Channel 2) you can afford to cut many corners in the construction of your version of this little rig.

LONG Long Yagis

Getting the Most out of Long In-Line V.H.F. Arrays

BY JAMES A. KMOSKO,* W2NLY, AND HERBERT G. JOHNSON,** W6QKI

• Nearly two years ago, the authors of this article discovered they had been working for some time along similar lines, investigating the possibilities of very long Yagi arrays for 2-meter DX. Both had been at it long enough to find out they had taken on a man-sized job. Combining forces, while working at opposite ends of the country, they have since built and tested scores of long-Yagi beams, cross-checking each other's results at frequent intervals. You may never want to build a 68-element monster such as W2NLY's latest effort, but anyone interested in parasitic arrays will find food for thought in this summary of the long-Yagi experiments of W2NLY and W6QKI.

EVERY good 2-meter man dreams of having an antenna that will really burn up the band but he soon finds when he tries to build it that a truly high-gain antenna system runs to tremendous size. The long-Yagi arrays for 144 Mc. built and tested by the writers are no exceptions to this rule. Their booms have dimensions normally encountered in 20-meter beams, but their performance goes a long way toward justifying such extremes.

Antenna textbooks contain very little information on extended Yagis, and with few exceptions[1] seem to discourage the idea. Some early radar gear ventured into the use of long Yagis, particularly in British designs, but narrow bandwidth and spurious lobe troubles led to adoption of other types. The writers' first experiments were made not only in quest of better v.h.f. antennas, but also out of curiosity as to how far the Yagi can be extended before "running out of gas."

Two rules soon became apparent. First, the length of the array is more important than the number of elements. Second, the improvement must be measured in terms of this length. As long as the antenna gain increases in direct proportion to the boom length, we are achieving all that can be expected.

At various times in our joint project we have had booms up to 40 feet long, and many combinations of element lengths and spacings have been investigated. Despite some differences in test procedure, and a separation of some 2500 miles, we have achieved quite good correlation of results, and several interesting and practical designs have been evolved.

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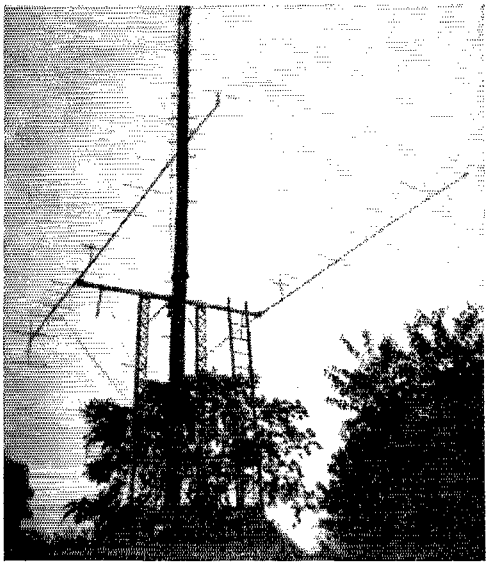
** 4410 Woodman Ave., Sherman Oaks, Calif.

[1] Bailey, *TV and Other Receiving Antennas*, page 462.

The first step in a program of antenna experimentation is the development of a suitable test set-up. It is not a simple matter to work out a test procedure that will yield honest *and* repeatable results in v.h.f. antenna measurement. At W2NLY, a transmitter was used to feed the antenna under test. The pick-up antenna was a dipole with a thermocouple at its center. The power level of the transmitter was varied to provide a constant reference level at the indicating device. These power variations could be converted directly into decibels as changes or comparisons were made.

The test set-up at W6QKI employed a Jerrold TV field-strength meter connected to the antenna being tested. A General Radio Signal Generator with a calibrated attenuator fed a corner-reflector array at a distance of 150 feet from the test point through coaxial line. The antenna under test was mounted on a turntable equipped with a compass,



Two of the 32-foot Yagis used in the 68-element 2-meter array built by W2NLY.

so that its heading could be determined accurately. Both antennas could be changed from vertical to horizontal polarization readily. Some sort of fairly directional antenna must be used at the remote point, unless the work is done in a flat open area completely devoid of objects that might cause reflections.

Measurement vs. *Calculation*

The test setups outlined above were satisfactory for comparative checks on forward gain, but

to have a real understanding of the performance of an array we must be able to visualize the entire pattern. This involves taking polar plots with both horizontal and vertical polarization, with readings for at least every ten degrees. As anyone who has tried it knows, this is an extremely tedious process when done by methods available to the backyard experimenter. We wanted such information on any final design, but for comparisons along the way a faster approach was a "must."

The following method has been in use for some time. While it is slightly less accurate than taking complete plots, it proved to be quite dependable and capable of being repeated with a satisfactory degree of accuracy. The half-power (3-db.) beam widths are determined with both polarizations; then the maximum secondary lobe amplitudes are measured, and the formula below applied:

$$G = \frac{32{,}027}{\phi v \phi h}$$

where G = power gain of array;
ϕv = beam width at half-power points in vertical plane; and
ϕh = beam width at half-power points in horizontal plane.

This assumes that secondary lobes are down at least 15 db. below the main lobe. Two side lobes which are 10 db. down will detract slightly from the calculated gain. Derivation of the above formula is explained in the appendix.

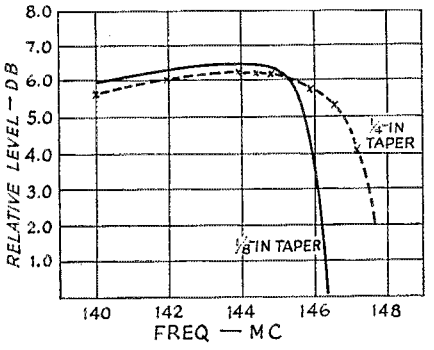


Fig. 1 — Relative response of 23-foot Yagi with director lengths tapered ⅛ and ¼ inch. Note that the reduction in length of ⅛ inch per element results in slightly more gain, but the ¼-inch taper gives better bandwidth.

Taking the 145-Mc. performance of the 17-element Yagi as an example:

$$G = \frac{32{,}027}{24 \times 26.5} = 50.3$$

or 17 db. gain, at 145 Mc.

Element Lengths and Spacings

Getting optimum performance from a long Yagi involves more than deciding what will be the maximum boom length you can handle, and then filling the available space up with a driven element, a reflector, and a string of directors. Just determining the optimum spacing alone is an involved process, as changes of any kind result in variations in driven-element impedance, making it necessary to adjust the construction of the driven element again and again to make sure that a proper match is maintained throughout the procedure.

We will not bore the reader with details of the long series of experiments that led to the conclusion, but it was found that with very long Yagis the spacing of the first three or four directors ahead of the driven element is quite critical. In the 23½-foot Yagi of Fig. 3 optimum spacing between the driven element and the first director, and between the first, second and third directors, is just over 0.1 wavelength. For the fourth it jumps to about 0.2 wavelength. From the fifth on the spacing is 0.4 wavelength. Considerably more gain is possible with a given boom length using these dimensions than can be obtained with more directors and the commonly-used 0.1- or 0.2-wavelength spacings. In drawing this conclusion every test made by each of the authors was duplicated and cross-checked by the other.

The optimum element length depends on the designer's objectives. Slightly higher gain is possible if all the directors are the same length. Best front-to-back ratio and highest side-lobe attenuation in a 2-meter array are obtained if each director is made progressively ¼ inch shorter than the preceding one, the longest being the firsta head of the driven element. A good compromise between these two extremes is reached by tapering the element lengths ⅛ inch for each director.

Some Working Models

Of the many combinations tried, two examples are described in detail and performance data for them presented herewith. One has 13 elements on a boom 23½ feet long. It is a simple in-line array with a reflector, a folded-dipole driven element, and 11 directors, spaced according to the earlier recommendations. The second has 13 directors, a driven element, and a trigonal reflector system; a total of 17 elements, on a 32-foot boom. A third has 18 in-line elements on a 37-foot truss-type boom. These may seem like massive proportions for 2-meter beams, but the light weight of the materials required makes the erection of either a simple task compared to the work involved in raising a 3-element 20-meter array. And their performance is something to behold, especially when it is borne in mind that the decibels quoted in the gain figures are of the honest variety, not the special elastic type often used in measuring the performance of TV antennas.

The curves of Fig. 1 show the relative response of the 23½-foot Yagi with element lengths tapered ⅛ and ¼ inch. It will be seen that while the ¼-inch reduction in length for each director sacrifices a small amount at 144 Mc., it provides a somewhat broader response, as might be expected, in addition to giving a cleaner pattern as to rear and side lobe sizes.

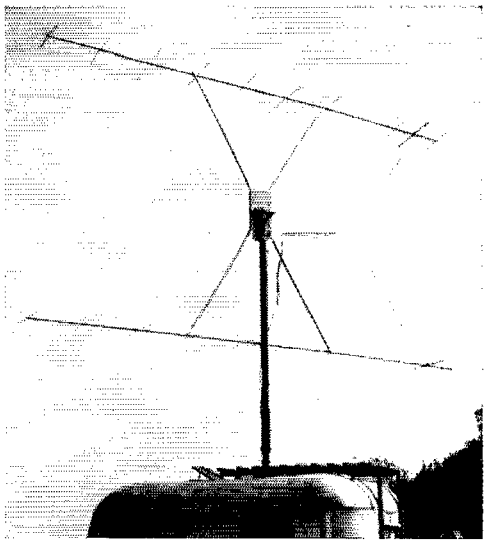
Polar plots of the antenna with uniform director length are shown in Fig. 2. Horizontal and vertical polarization curves at the left were

taken at 144 Mc. Next are the horizontal plots at 144 and 145 Mc. Note that over the first megacycle of the band there is only a slight difference in performance, though it can be seen that the forward lobe is a bit sharper and the side lobes are increasing in size at the higher frequency. The performance of the array falls off sharply above 145 Mc., however, as shown in the plots for 145.5 and 146 Mc., at the right.

Element lengths for two versions of the 23½-foot Yagi are as follows: reflector 41½ inches, driven element 39½ inches, first director 37¾ inches. For ⅛-inch taper, the other directors are 37⅝, 37½, 37⅜, 37¼, 37⅛, 37, 36⅞, 36¾, 36⅝, and 36½ inches. For ¼-inch taper, they are 37⅝, 37½, 37¼, 37, 36¾, 36½, 36¼, 36, 35¾, and 35½ inches. Note that the first three directors are the same in both models. Element spacings: reflector to driven element, 20 inches; driven element to first director, 7 inches; first to second director, 7½ inches; second to third director, 7½ inches; third to fourth director, 16 inches; fourth to fifth director and between all additional directors, 32 inches.

Element lengths apply only if the element size and mounting method employed are similar to those used in the original model, as shown in Fig. 3. Figures are for peak response at the low end of the band. For higher frequencies, decrease all lengths approximately ¼ inch for each megacycle. The front-to-back ratio of any of these combinations can be improved by cutting the forward director an additional ¼ inch shorter than the figures given. This nets an improvement of 4 to 6 db. in front-to-back, at a cost of a barely perceptible drop in forward gain.

Spacings of 11½ inches for the first director, 7 inches for the second, 22½ inches for the third, and 32 inches for all others are used in the 17-element 32-foot array. The additional directors and the trigonal reflector system yield considerably lower back and side lobe pickup. Normally these factors are not considered important in a v.h.f. array, but where extremely high gain is achieved, as in these beams, large secondary lobes may lead to considerable confusion in aiming the array correctly, unless the true heading for the desired station is known. A clean pattern for the individual bays is also important if optimum results are to be achieved with wide-spaced stacked systems.



Stacked 13-over-13 used by W6QKI/6 for mountaintop v.h.f. expeditions. This array is arranged for use with either vertical or horizontal polarization. Booms are 23½ feet long.

Many tests were made with reflector elements above and below the driven element in addition to the usual one behind it. Spacings up to a half wavelength were tried, at various points ahead of and behind the driven element. Optimum front-to-back ratio was achieved with the top and bottom elements of the trigonal system one quarter wavelength above and below the driven element,

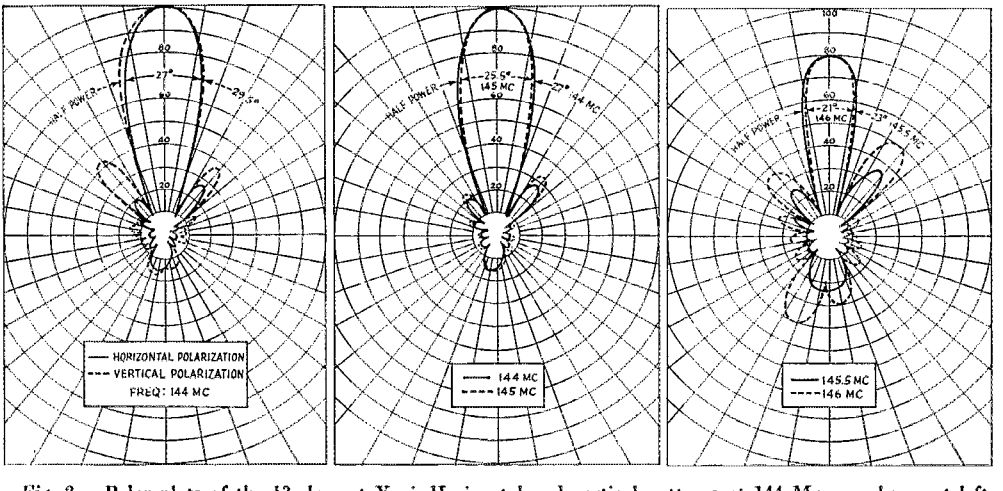


Fig. 2 — Polar plots of the 13-element Yagi. Horizontal and vertical patterns at 144 Mc. are shown at left. Center: the horizontal patterns at 144 and 145 Mc. are compared. Rapid deterioration in performance with higher frequency is shown in the 145.5- and 146-Mc. curves at right.

and a similar distance behind it. The reflector in the plane of the other elements is placed 15 inches in back of the dipole. Shortening this element, or moving it with respect to the dipole, results in considerable change in the dipole impedance, and it affects the front-to-back ratio of the system adversely.

If high front-to-back ratio is not desired, a single parasitic reflector 40.5 inches long and 19

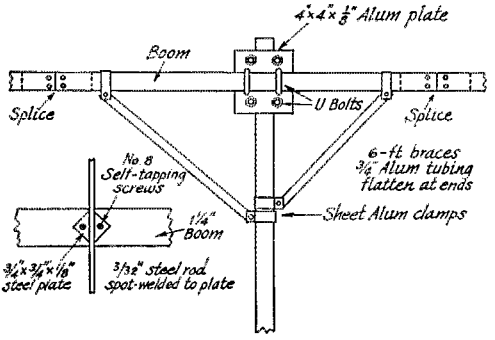


Fig. 3 — Boom support and element mounting methods used in the 13-element Yagi.

inches in back of the driven element can be used with only 0.75-db. reduction in forward gain. Use of the trigonal system is highly recommended, however.

Element lengths and spacings for the 17-element Yagi are as follows: upper and lower reflectors 40.5 inches, rear reflector 42.5 inches, folded dipole 38¾ inches, first director 37 inches, following directors 36⅞, 36⅜, 36⅛, 35⅞, 35⅝, 35⅜, 35⅛, 34⅞, 34⅝, 34⅜, 34⅛ and 33⅝ inches. Except for the position of the reflector elements and the first three directors, already noted, the spacings are similar to those of the 13-element model. As mentioned in connection with the smaller array, the element lengths given are correct only for a mounting method that puts the same mass of metal in contact with the elements as in the original models (see later constructional details). Early experiments with wooden booms showed confusing indications as moisture content of the wood varied with the weather.

The element spacings given can be used for arrays of widely varying boom lengths, in case the reader wishes to build a Yagi array that is smaller than the examples given. (Or in the remote chance that he may be interested in something larger!) Gains that can be expected with boom lengths up to more than 40 feet with director lengths tapered ⅛ inch can be taken from the curve of Fig. 4. It was determined by experiment that use of more elements for a given length of boom resulted in lower gain and generally poorer performance in every case where the boom was more than 14 feet in length. This would be an 8-element array with the spacings shown.

The calculated gain of the 17-element Yagi with ¼-inch taper in director lengths is just over 17 db., a figure that seems conservative on the basis of observations made in receiving with such an array, in comparison with a dipole at the same height above ground. Actually, the forward gain of the large array is only a little more than one decibel higher than that of the 23-foot model, but a glance at its polar plot, Fig. 5, shows that it is better in regard to side and rear lobes.

A 37-foot 18-element Yagi has been in operation on 144 Mc. at W6QKI for some months. This antenna has 16 directors, a folded-dipole driven element and a single reflector, with the director lengths tapered ¼ inch each. They are spaced 7, 7½, 7½, 18 and 32 inches, with all the rest 32 inches apart. The reflector is 20 inches behind the driven element. All parasitic elements are ⅛-inch aluminum rods, on insulating blocks 1½ inches above the boom. The array is 40 feet above ground. Its gain runs around 18 db.

Some Constructional Ideas

There are countless ways of building beam antennas, and construction methods are almost certain to vary from one ham to another, depending on materials and tools that may be available for the job. The mechanical design of the 13- and 17-element Yagis illustrates this. The assemblies used in the 13-element model would be difficult for many hams, but for others who have access to the necessary materials and tools they would be easy to make. The elements, except the dipole, are all 3/32-inch steel rods. These are spot-welded to ¾ × ¾ × 1/16-inch steel plates, and these in turn are held to the boom by two No. 8 self-tapping screws. The welded element assemblies were plated, first with copper and then silver.

The driven element is made of ½-inch and ⅛-inch sections spaced 1 inch center to center. With the element lengths and spacings shown this results in a 300-ohm feed impedance.

The boom is 1¼-inch dural or aluminum tubing mounted to the vertical support as shown in Fig. 3. It is unlikely that 23½ feet can be ob-

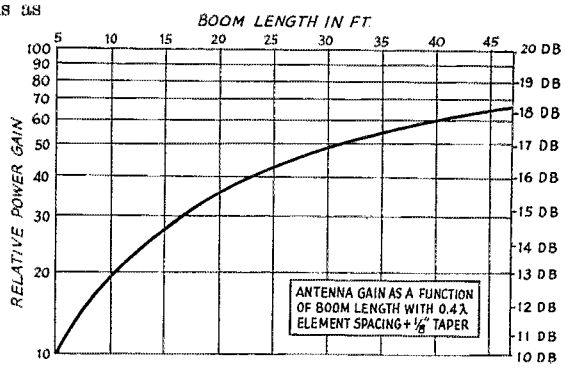


Fig. 4 — Gain that can be expected from 144-Mc. Yagi arrays of boom lengths up to 45 feet. This curve is valid only if the director lengths are tapered ⅛ inch for each element. Slightly higher gain is obtained with all directors the same length, but at a sacrifice in front-to-back ratio.

tained in one piece, so sections of any convenient length can be spliced together with sleeve inserts of the same material. Sections of the boom tubing about one foot long are slotted lengthwise and then squeezed together to fit inside the pieces to be spliced. The joining sleeves are fastened to the boom with self-tapping screws.

The boom is supported by means of a 4 × 4 × ⅛-inch aluminum plate and four TV-type U bolts (see Fig. 3.). Braces to prevent sag in the boom are made of ¾-inch tubing, flattened at each end and fastened to the boom and vertical member with sheet aluminum clamps.

Because it was intended to stack four of them in a huge array, the 17-element Yagis were designed so as to keep weight and wind resistance to the lowest value possible.

Shortly after the 68-element colossus was mounted atop its supporting pole, and before the installation was completely tied down, a sudden windstorm with gusts up to 90 miles per hour severely damaged three of the four Yagis. A second storm two weeks later completed the destruction. It is felt that if the installation had been complete when the first storm hit the array would have ridden it out safely, however the construction was on the light side and a complete rebuilding is now getting underway. This time the design will be such as to withstand the kind of storms we are having along the Atlantic Seaboard of late, at any stage of its construction or erection.

The method of mounting the elements to the booms appears to have been satisfactory, and since it employs a method we've not seen used heretofore it may be of interest to other antenna experimenters. A lightweight boom 32 feet long is likely to have some sag. This can be compensated for by mounting the elements at gradually increasing heights above the boom, to keep them in alignment. Brackets for supporting the elements were made of ½ × ¼-inch aluminum channel, a material that can be purchased at most hardware stores. The element mounts themselves are No. 8 eletrical ground lugs, obtainable from any electrical supply house. As made, these have a ¼-inch set screw and a floating mechanical joint. The only modification necessary is to solder the two portions together and drill a ⅛-inch hole at right angles to the screw (Fig. 6-B), so that when the element is inserted in the hole the screw can be set down on it. The edges of the channel are crimped down over the end of the lug, which is then fastened to it with a 6-32 cadmium-plated screw. The boom can be mounted in place, and the length and degree of bending of the aluminum-channel element mounts can be adjusted to correct for the sag in the forward portion of the boom. In bending the aluminum channel don't go too far with one bend, as about 35 degrees is the breaking point with the material used here.

The folded-dipole driven element uses this same aluminum channel stock for the solid portion. The fed portion is ⅛-inch aluminum wire, fastened at the outer ends to the channel with an aluminum bolt. Three aluminum nuts are used,

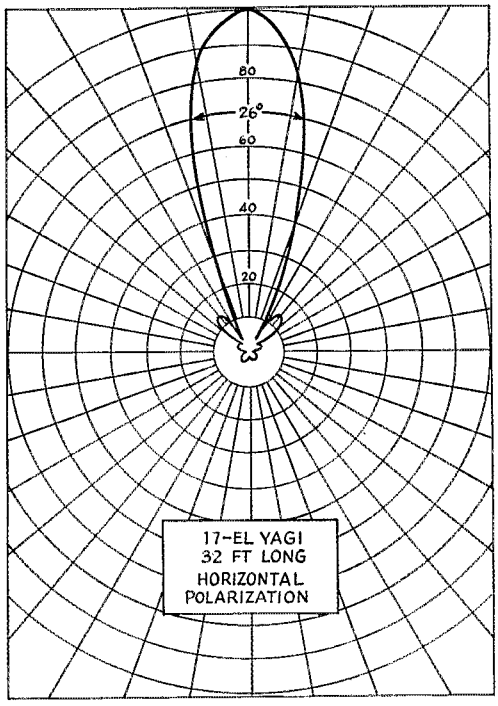


Fig. 5 — Horizontal pattern of the 17-element 32-foot Yagi, with director lengths tapered ¼ inch per element. Note very high front-to-back ratio, and small minor lobes.

one clamping tightly on the channel, and the other two holding the aluminum wire at a point ¾ inch from the center of the channel stock. In the experimental stages of the project this made a convenient way to change the spacing of the portions of the folded dipole, to provide various degrees of impedance step-up. As it is a solid assembly there was no reason to change it when the array reached its final form. The inner ends of the fed portion of the dipole are mounted on a piece of ¼-inch polystyrene, 1½ by 2½ inches in size, bolted to the channel. Details of the folded dipole mount are similar to Fig. 6-A.

The trigonal reflector elements are also mounted in a section of channel. The electrical ground-lug assemblies are used to hold the elements at each end, and the vertical support of channel stock is held to the boom in a manner similar to that used with the driven element.

As the driven element is many feet back from the vertical support in such an array, handling of the feed line presents a problem. This is taken care of by several lucite supports, 15 inches long over-all, slotted at one end to take the spreaders in open-wire TV line. The other end is fastened to the boom, or to the rear brace that supports the boom, with hose clamps.

Performance

It is only natural for anyone looking upon one of these oversized Yagis for the first time to ask whether all the trouble the writers have gone to is worth it. To the uninitiated, at least, the gain

figures quoted may not seem to justify the means. The more experienced antenna men know, however, that gain is a difficult thing to appraise properly, and that "gain" figures, reported to be in decibels, have been tossed around so lightly in recent years that many amateurs have a somewhat erroneous idea of the meaning of the term.

The writers believe that the figures given in this report are on the conservative side, and evidence so far gathered in the limited on-the-air work with these large Yagis seems to bear this out. At W2NLY a single 17-element Yagi has shown gains in excess of 20 db. on reception, in comparison with a dipole of the same height. This was on a receiver S meter whose calibration has been checked carefully.

At W6QKI the 37-foot 18-element Yagi has worked consistently out of the San Fernando Valley to W7VMP, Phoenix, Ariz., some 370 miles over rugged terrain. Two of the 23½-foot models, stacked 14 feet apart in a flip-flop arrangement, have been used a number of times in work from portable locations, with excellent results.

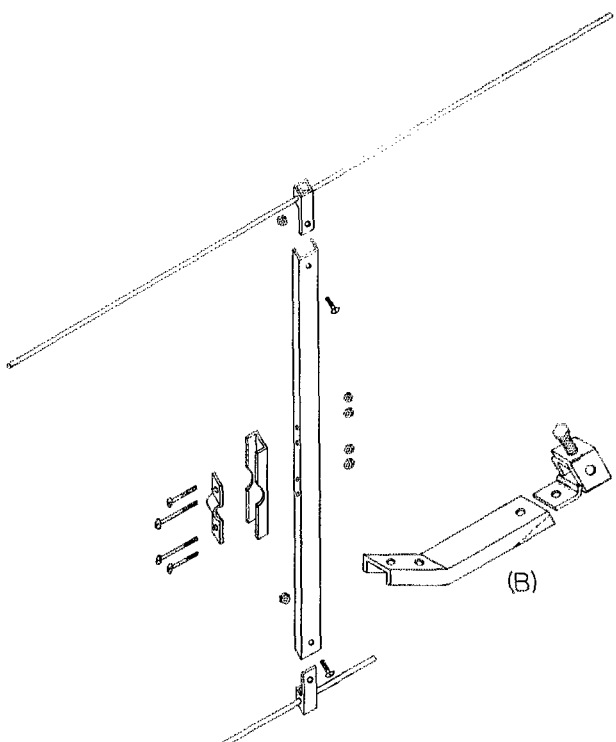


Fig. 6 — Method of mounting elements employed in the construction of the 32-foot Yagi. Electricians grounding lugs attached to sections of aluminum channel hold ⅛-inch rods in place. Mounting brackets, B, can be made of varying height, if necessary, to compensate for sag in the long boom. A reflector mount is shown at A.

Conclusions

It can be demonstrated that these long Yagis outperform many antennas of greater size and weight. This is important to the DX operator who wants the most out of the biggest antenna he can manage. The inherent high-Q characteristic of the Yagi produces this gain. It results in a large field around the array, referred to as "effective aperture," or sometimes "capture area." The 23½-foot model has an effective aperture of 18 feet. The 32-foot antenna has an aperture about 20 feet in diameter. A low-Q array must occupy this much area to have equivalent gain.

Such performance is not bought for nothing in the Yagi. It sacrifices bandwidth for gain. It is not for the fellow who wants to work over the entire 2-meter band. The writers found that the diameter of the director elements is of some importance. Results could not be duplicated with elements larger than ⅛ inch in diameter. Silver plating the elements offers a slight improvement over plain aluminum or aluminum alloys. If steel elements are used, plating is recommended. Silver plating can be protected by coating with plastic spray. It is quite possible that gold plating would be even better than silver, though not many hams are likely to be able to afford it.

The radiation resistance does not drop as low as might be expected, probably because of the wide spacing of most of the directors. The first few bring it down to about 20 ohms, and it fluctuates between 15 and 20 ohms as additional directors are added.

Appendix

Power gain calculations from half-power beam widths, ϕ_v and ϕ_h

$$D = \frac{\text{Surface area of sphere illuminated by isotropic radiator}}{\text{Area of ellipse illuminated by directional array at half-power angles where}}$$

D = Power gain over isotropic radiator,
Surface area of sphere = $4\pi r^2$
Area of ellipse = πAB

$$A \text{ in radians} = \frac{\phi_v}{114.59}$$

$$B \text{ in radians} = \frac{\phi_h}{114.59}$$

$$D = \frac{4\pi \text{ Sq. radians}}{\pi \frac{\phi_v \phi_h}{(114.59)^2}} = \frac{4\pi (114.59)^2}{\pi \phi_v \phi_h}$$

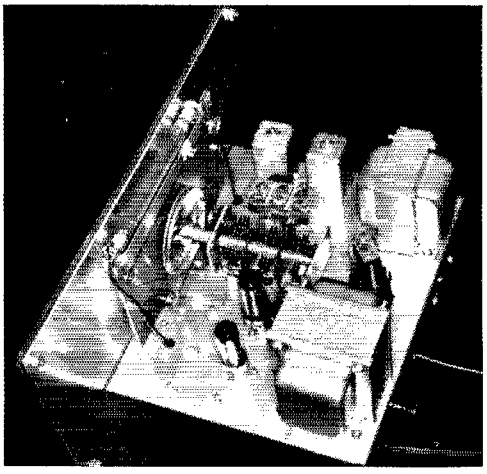
$$= \frac{52{,}525}{\phi_v \phi_h}$$

$$\text{Gain over dipole} = \frac{D}{1.64} = \frac{32{,}027}{\phi_v \phi_h}$$

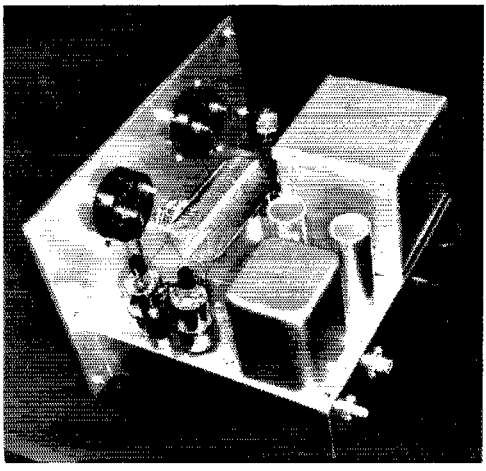
W6TZZ Transmitter Design Wins Detroit Trip

A TRANSMITTER Roger Monell, W6TZZ of Los Angeles, Calif., built in his 11th grade electric class at Dorsey High School turned out to be worth $150 and a trip to Detroit. The transmitter won a prize in the Ford Motor Company Industrial Arts Awards competition, and W6TZZ was brought to Detroit with 31 other national award winners to "see the sights" and receive the prize money and a sweater. He was accompanied by Don Brockway, W6PL, his electronics instructor at Dorsey High.

Young Mr. Monell's prize-winning transmitter uses a 6AQ5 VFO in the 160-meter band, followed by a 5763 frequency multiplier that drives the parallel 6146s in the output stage. The plate circuit of the VFO is tuned to 80 meters, and the VFO grid, VFO plate and multiplier plate circuits are gang-tuned by the string drive and slide-rule dial shown in the photographs. In the output stage the screen is clamp-tube modulated by one triode of a 12AU7, in a circuit that appeared in *QST* a year ago.[1] W6TZZ used the circuit because ". . . the potentiometer in the grid circuit of the clamp tube offers an excellent means for controlling the output of the transmitter." The speech amplifier for the clamp tube uses both sections of a 12AU7. The 6146s run up to about 120 watts input at the plate voltage of 500.



The exciter section of the transmitter and its power supply. The 3-gang capacitor tunes the VFO grid and plate and the driver plate.



The output amplifier and its power supply. The clamp-tube modulator and its speech amplifier are hidden by the far end of the coil.

The construction of the transmitter shows several novel features, but the panel is perhaps the most outstanding. The panel is built up of three layers: thin aluminum, then a sheet of Formica (the kind used for table tops), and then a sheet of ⅛-inch clear plastic. Decals on the Formica identify the controls. The Formica has a touch of gold color in it that sets off the custom aluminum knobs W6TZZ turned on the school lathe. To complete the professional touch, the transmitter power supply components were sprayed with aluminum-colored lacquer.

— *B. G.*

[1] Beling, "A Protective Circuit for Transmitting Tetrodes," *QST*, October, 1954.

◆

Roger Monell, W6TZZ of Los Angeles, tuning his prize-winning transmitter. Those knobs are custom-built jobs, turned out of aluminum by W6TZZ on his school lathe. W6TZZ's father is W6QGY.

◆

Using a mechanical filter for sideband selection, this s.s.b. exciter includes VFO, voice control, test tone circuits, and broad-band tuning through the 4-, 7-, and 14-Mc. phone bands. The output tube is a Class A 6AG7.

A Three-Band S.S.B. Exciter Using a Mechanical Filter

4, 7 and 14 Mc. with Bandpass Tuning

BY DAVID B. HOISINGTON,* W6CHB

THE MECHANICAL FILTERS [1,2] introduced within the past few years are ideally suited for use in single-sideband transmitters. These filters have excellent skirt selectivity on both sides, so either sideband may be selected with very great rejection of the unwanted sideband. Being pretuned, their use leads to an exciter which is easy to align with a minimum of test equipment. The circuits are stable and will remain aligned over long periods of time. A minimum of adjustment is required when changing carrier frequency.

The exciter to be described was designed to take advantage of these characteristics. More than one watt of sideband or sideband-plus-carrier may be obtained anywhere in the 4-Mc., 7-Mc., or 14-Mc. phone bands. The unit contains a VFO, an audio test-signal source, provision for the equivalent of a two-tone test signal, speech-clipping circuits, and voice-controlled break-in. For maximum frequency stability, crystal-controlled conversion is used from the 4- to the 7- and 14-Mc. phone bands. Thirteen tubes are used, two of them in the power supply. Any ham with a moderate amount of construction experience should be able to duplicate and align the unit with little difficulty. If the voice-controlled break-in, speech clipping, and 7- and 14-Mc. operation are eliminated, only ten tubes are required. If an external VFO is used another tube can be eliminated, leaving only seven tubes plus two in the power supply.

The view of the front panel shows quite an array of controls, but only a few of these are used in normal operation. The main tuning control is centered on the upper part of the panel. The ten controls across the lower part of the panel are:

1) Power, on–off.
2) Band selector.
3) Function control, giving a choice of *Voice Control, Receive,* or *Transmit.*
4) Frequency-check switch, which gives a weak carrier signal in the receiver for setting the exciter frequency.
5) Frequency vernier.
6) Sideband selector.
7) Carrier insertion.
8) Output level.
9) Audio gain.
10) Input selector, giving 300- or 1000- c.p.s. test signals, or normal operation with the microphone.

Circuit

For convenience, the complete circuit diagram of the exciter is shown in four sections, Figs. 1 through 4. V_1 serves as an audio amplifier or, for test purposes, an audio oscillator. With S_1 in the 300- or 1000-c.p.s. position low-pass ladder phase-shift networks are connected from plate to grid. Harmonics are attenuated by the networks, so a good sine wave is obtained at the grid without any critical adjustment, as would be necessary if high-pass networks were used. V_{2A} is an audio amplifier. V_{2B} and V_{4A} together constitute a cathode-coupled peak clipper. A large common cathode resistor is used to prevent grid-current flow on large signals; symmetrical clipping results. The degree of clipping is controlled by means of the audio-gain potentiometer in the grid circuit.

The audio signal from the plate of V_{2B} is fed to the diode plate of V_3 through a 0.1-μf. capacitor. The resulting negative bias cuts off the triode plate current when S_2 is in the v.c. (voice control) position, releasing the relay. One pair of relay

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[1] Leslie L. Burns, jr., "A Band-Pass Mechanical Filter or 100 Kilocycles," *RCA Review*, March, 1952, page 34.

[2] Ben Roberts, "Mechanical Bandpass Filters for I.F. Ranges," *QST*, February, 1953, page 22.

contacts then turns on the remaining exciter circuits, while the other pair is used to control the receiver, antenna change-over relay, or other circuits. The relay operates very quickly, only a small portion of the first syllable being lost when conversation is started. The unit remains on for about a half second after the last word. If it is desired to have the transmitter remain on for a longer period, the 0.1-μf. coupling capacitor may be increased to 0.25 or 0.5 μf.

The potentiometer in the plate of V_{4A} serves to control the exciter output. It is shunted by a fixed resistor to prevent overloading of later stages. V_{4B} is a phase-splitter for giving a push-pull signal to drive the grids of the first balanced modulator V_5 (Fig. 2). The 455-kc. carrier is applied in phase to both cathodes of V_5. The amplitude is kept small, making it easy to balance out the carrier. The balanced modulator feeds the Collins mechanical filter, where one sideband is clipped. No audio filter is needed after the speech clipper because the mechanical filter is sharp enough to remove higher-order sidebands.

V_6 is the 455-kc. oscillator. Good stability is required, so the Clapp circuit is used. L_{10} may be any good quality shielded 455-kc. b.f.o. coil.

• The characteristics of the 3-kc. mechanical filter are such that very high suppression of undesired-sideband and other out-of-band components can be secured without critical adjustment. The single-sideband exciter described in this article uses the Collins filter in a circuit arrangement combining practically all the operating features s.s.b. experience has shown to be desirable.

An inexpensive unit was first tried with poor results — the frequency would jump by 100 c.p.s. whenever a door was closed! A most important consideration is mechanical stability. Both coil and tuning slug should be solidly mounted to prevent relative motion between them. One coil of a well-built 455-kc. i.f. transformer was also tried and found to be satisfactory; the secondary coil was disconnected from its tuning capacitor to prevent interaction. C_{38} should be 5 $\mu\mu$f. larger than the capacitor originally used to tune the coil to 455 kc. A silver mica capacitor may be used, but a combination of ceramic capacitors giving a temperature coefficient of -25 or -30 parts per million should result in less frequency

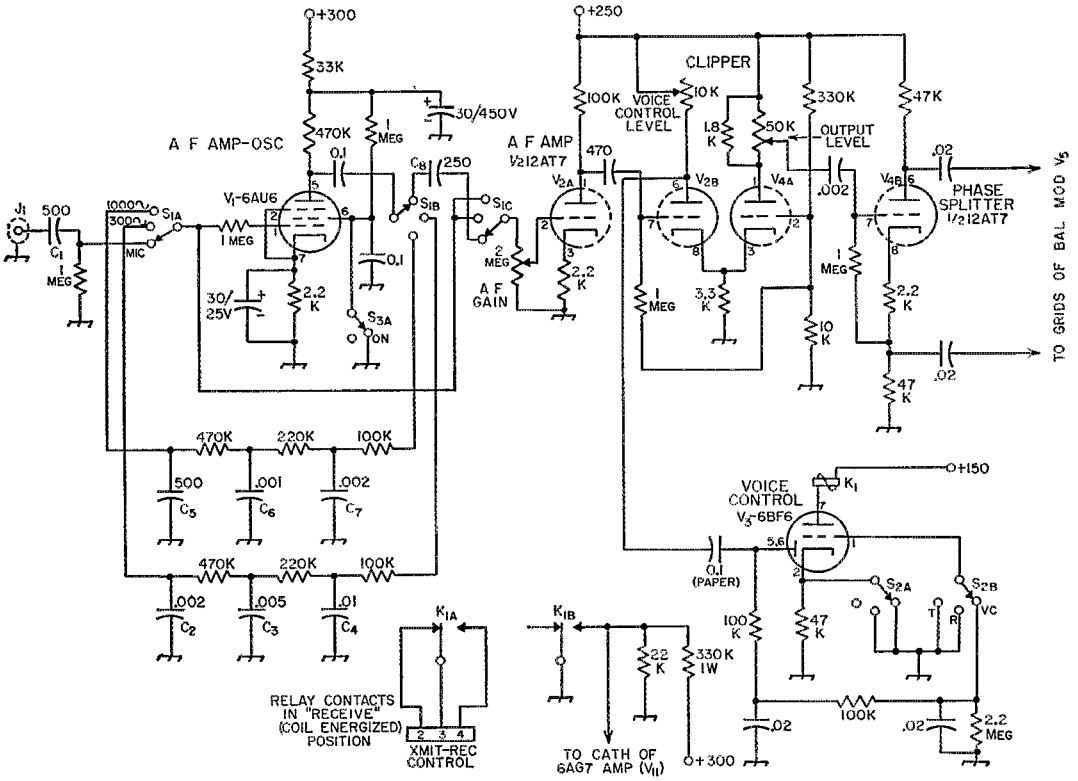


Fig. 1 — Audio- and voice-control circuits. Capacitances below 0.001 μf. are in $\mu\mu$f. Unless otherwise specified, capacitors are disk ceramic, 500 or 600-volt. Fixed resistors are ½-watt composition.

C_1, C_8 — Mica.
C_2 – C_7, inc. — Mica, 5-per-cent tolerance.
J_1 — Microphone connector (Amphenol 75-PC1M).
K_1 — D.p.d.t. relay, 5000-ohm coil (Potter & Brumfield LM-11).
S_1 — 4-pole 3-position rotary, nonshorting (Mallory 3243J). (Only three poles are used.)
S_2 — 2-pole 3-position ceramic rotary, shorting (Centralab PA-2002).
S_3 — D.p.d.t. toggle (S_{3B} shown on Fig. 2).

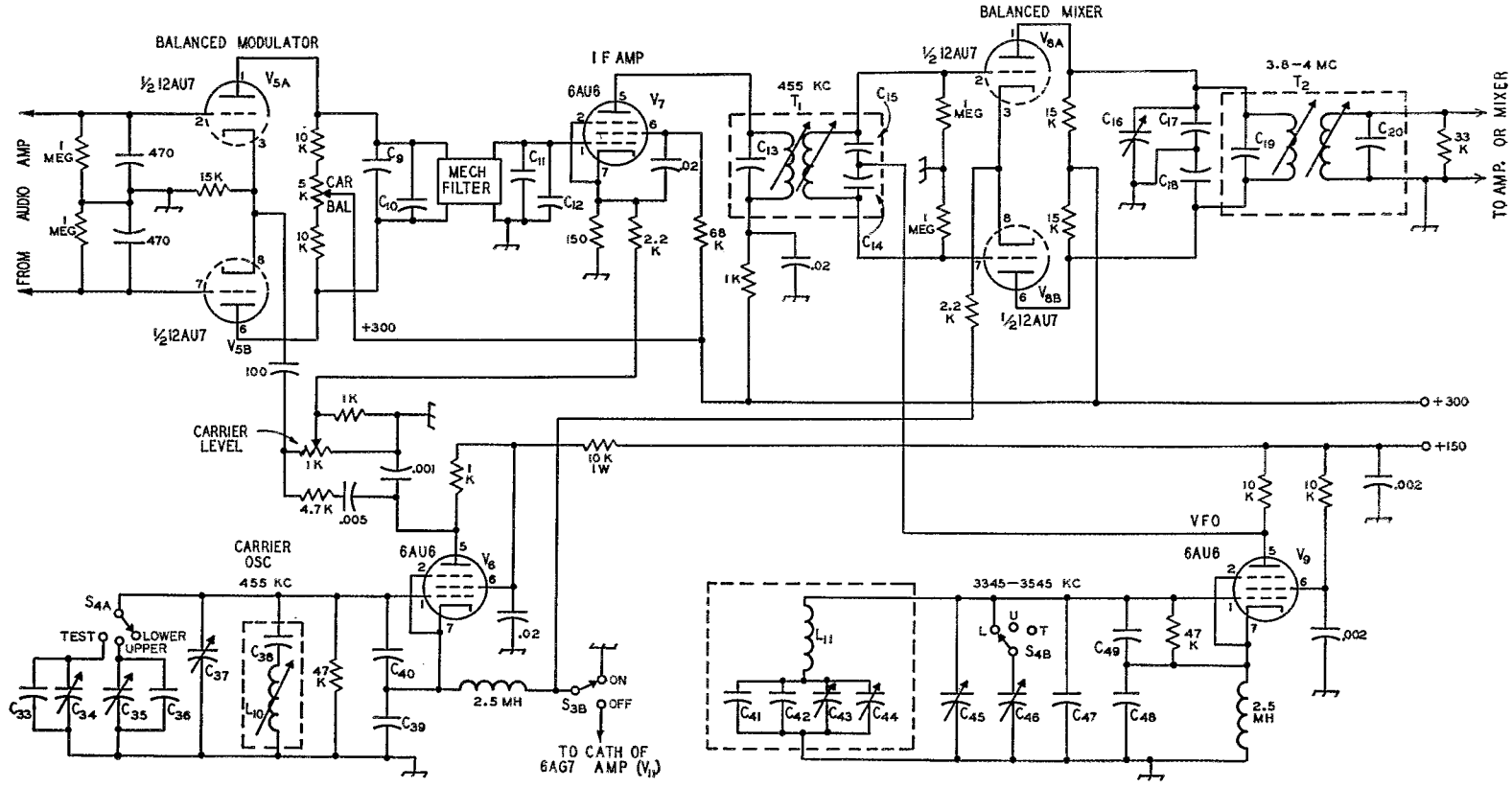


Fig. 2 — Sideband-generating and 4-Mc. frequency conversion circuits. Capacitances below 0.001 μf. are in μμf. Unless otherwise specified, capacitors are disk ceramic, 500- or 600-volt. Fixed resistors are ½-watt composition except where noted.

C_9, C_{11} — 100-μμf. NP0 ceramic, 5-per-cent tolerance.
C_{10}, C_{12} — 39-μμf. NP0 ceramic, 5-per-cent tolerance.
C_{13} — Part of T_1.
C_{14}, C_{15} — See text.
C_{16} — 7–45-μμf. ceramic trimmer.
C_{17}, C_{18} — See text.
C_{19}, C_{20} — Part of T_2.
C_{21}-C_{32}, inc. — Shown on Fig. 3.
C_{33} — 10-μμf. NP0 ceramic.
C_{34}, C_{35}, C_{37}, C_{46} — 1–8-μμf. trimmer (Erie 532–10).
C_{36} — 25-μμf. NP0 ceramic, 10-per-cent tolerance.
C_{38} — See text.
C_{39}, C_{40}, C_{48}, C_{49} — 0.001-μf. silver mica, 5-per-cent tolerance.
C_{41} — 22-μμf. N080 ceramic, 10-per-cent tolerance.
C_{42} — 39-μμf. NP0 ceramic, 5-per-cent tolerance.
C_{43}, C_{44} — 15-μμf. variable (see text).
C_{45} — 1-μμf. variable (see text).
C_{47} — 75-μμf. N750 ceramic.
L_{10} — B.f.o. transformer, 455 kc., permeability tuned (see text).
L_{11} — 36 turns No. 20 enam., length 1 5/16 inches, diam. 1½ inches, wound on ceramic form (see text).
MECH. FILTER — 3.1-kc. bandwidth (Collins F455D-31).
S_3 — D.p.d.t. toggle (S_{3A} shown on Fig. 1).
T_1 — 455-kc. i.f. transformer (see text).
T_2 — 4.5-Mc. sound-i.f. transformer (Miller 1466-TV).

drift. A combination of about one third N080 and two thirds NP0 (zero temperature coefficient) ceramics should be about right. These should be mounted inside the shield with the coil.

The oscillator frequency may be shifted to either edge of the filter pass band by means of S_4 so that either the upper or lower sideband may be transmitted. S_4 simultaneously shifts the VFO frequency enough to keep the final carrier frequency approximately constant. A potentiometer in the plate circuit provides a carrier signal when wanted. This circuit is so arranged that when the carrier amplitude is increased the signal amplitude is simultaneously decreased to keep the output level approximately constant. A 0.001-μf. capacitor from the plate of V_6 to ground limits the 455-kc. signal to the desired amplitude and improves its waveshape.

V_7 is a 455-kc. amplifier. The carrier is inserted on its cathode. The slug-tuned i.f. transformer in the plate circuit is modified by replacing the secondary tuning capacitor by a series-connected pair of capacitors, each twice as large as the original. In other words, if the original capacitor is 75 $\mu\mu$f., C_{14} and C_{15} should each be 150 $\mu\mu$f. Silver micas or low temperature coefficient ceramics with a 5 per cent tolerance are satisfactory.

V_8, the second balanced modulator, heterodynes the signal to the 4-Mc. phone band. The frequency of the VFO, V_9, is 455 kc. lower. C_{41}, C_{42}, and C_{47} are temperature-compensating capactors to improve the Clapp oscillator stability. The first two are mounted inside the coil shield with L_{11}, C_{43}, and C_{44}. C_{47} is mounted under the chassis. V_9 runs continuously since its frequency is different from the operating frequency. The over-all frequency drift of the exciter was found to be less than 100 c.p.s. in a period of six hours after turning the unit on. Don't expect to get results quite this good, however, without a little experimentation, for different components have different temperature coefficients. C_{47} compensates for changes in components that heat rapidly, while C_{41} and C_{42} compensate for temperature changes within the coil shield. If no major changes are made in the components, the stability should be satisfactory with the compensating capacitors specified.

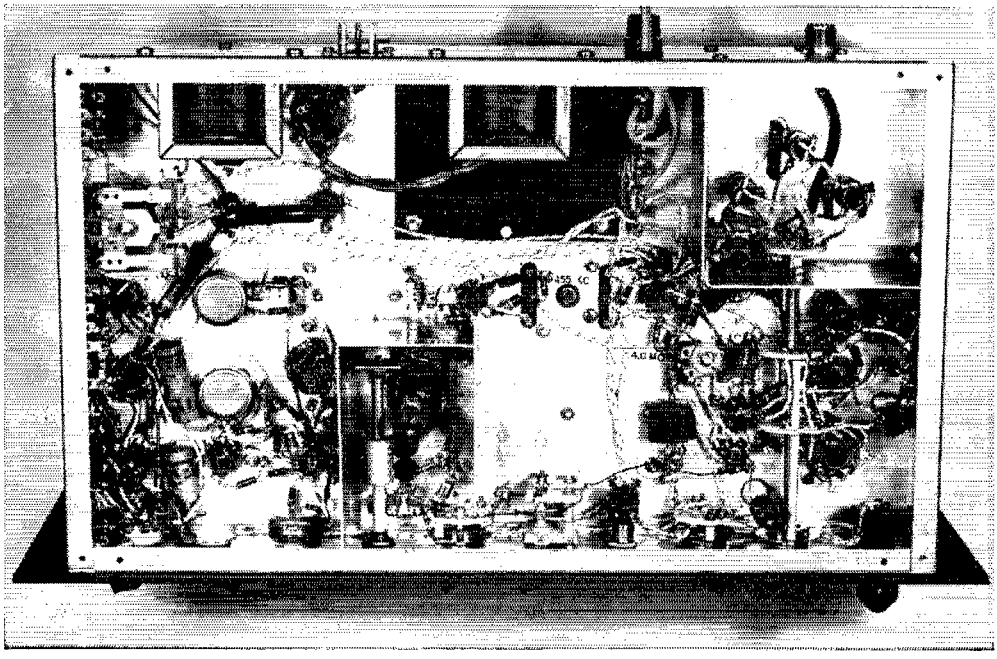
On 4 Mc. the output of V_8 is fed directly to V_{11}, the 6AG7 power amplifier (Fig. 3). On 7 and 14 Mc. the 6 × 8 frequency converter, V_{10}, is switched into the circuit. The triode portion of this tube is a crystal oscillator. The common cathode resistor provides injection to the pentode frequency-converter section.

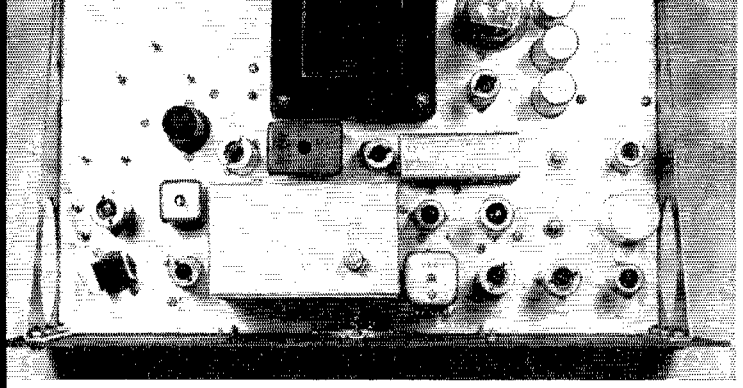
Tuned circuits at the output frequencies are broad-banded by a combination of stagger tuning with low-Q coils so that the exciter output does not change greatly when tuning over the band. Any variation that does exist may be compensated for by changing the setting of the output level control.

The resistance of R_1 in the power supply (Fig. 4) is adjusted to give 300 volts with the unit in operation. More or less resistance will be required if the transformer voltage is higher or lower than specified.

When the exciter is in the "stand-by" or "receive" condition, V_6, V_8, and V_{11} are all

Below-chassis layout. As mentioned in the text, good shielding in the 455-kc. circuits is essential for low carrier leakage. The various sections of the exciter can be identified by reference to the top-of-chassis view. The final r.f. output circuits are enclosed in the shield at the upper right.





Plan view of the exciter chassis. R.F. conversion and output circuits are on the left-hand side. The VFO is enclosed in the shield box just behind the tuning dial. Audio circuits are in the lower right corner, near the panel, and the voice-control components are along the right-hand edge. Sideband-generating and i.f. circuits are between the power supply (at top right center) and VFO-audio section. The mechanical filter is covered by the shield just off the upper right-hand corner of the VFO compartment.

♦

disabled. Turning the frequency-check switch on puts all tubes except the final amplifier in operation, but disables the audio amplifier. Enough carrier signal then leaks out so that the frequency may be adjusted to zero beat with a signal heard in the receiver.

Construction

The exciter is built on an 11 × 17 × 3-inch aluminum chassis with an 8¾-inch rack panel. The VFO tuned circuit is enclosed in a 3 × 4 × 5-inch aluminum box. The tuning capacitor, C_{44}, should have a range of 13 $\mu\mu$f. A surplus Sickles capacitor (351–1039) was used, but any small, sturdy capacitor having this range, such as the Cardwell ZR-15AS or Hammarlund MC-20-S, would be satisfactory. The range-setting capacitor, C_{43}, is an identical capacitor mounted on the top of the box. The same capacitor was used for C_{45}, the frequency vernier, but was cut down to two plates with a spacing of about 5/64 inch. This gives about 1-$\mu\mu$f. capacitance variation and a VFO frequency change of about 800 c.p.s. This control is not absolutely necessary, but is useful in fine setting of the exciter frequency. The main tuning dial is a National ACN.

L_{11} is wound on a grooved ceramic form salvaged from a war-surplus TU-7-B tuning unit. It must be cut down in length (with a silicon-carbide cut-off wheel on a circular saw) to fit in the shield box. If a different material such as polystyrene is used, it may be necessary to use

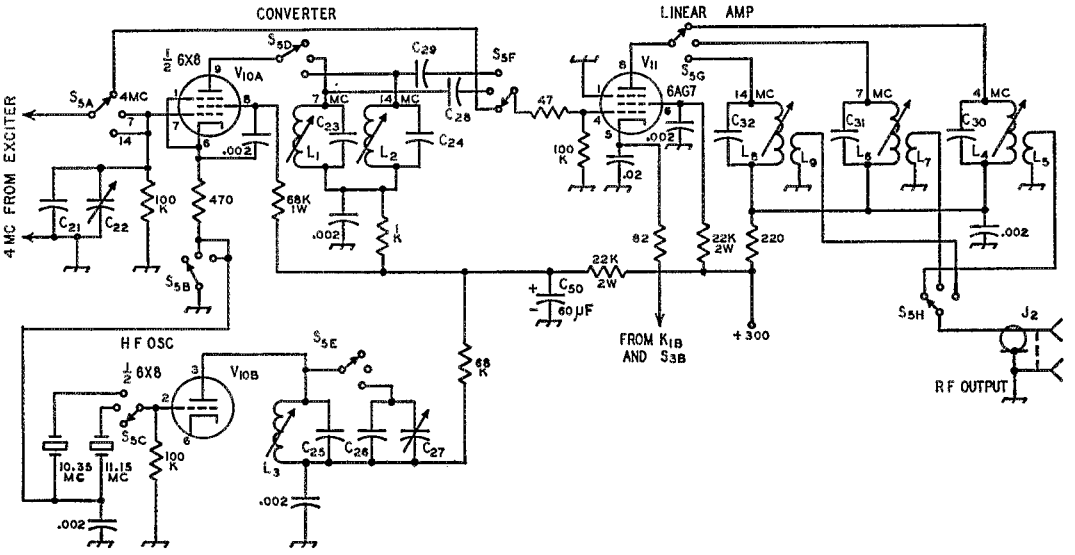


Fig. 3 — Frequency-conversion circuits for 7 and 14 Mc. Capacitances are in μf. Unless otherwise specified capacitors are disk ceramic. Resistors are composition, ½-watt except where noted.

C_{21}, C_{26} — 10-$\mu\mu$f. NP0 ceramic.
C_{22}, C_{27} — 1–8-$\mu\mu$f. trimmer (Erie 532–10).
C_{23}, C_{31} — 150-$\mu\mu$f. silver mica, 5-per-cent tolerance.
C_{24} — 51-$\mu\mu$f. silver mica, 5-per-cent tolerance.
C_{25} — 100-$\mu\mu$f. NP0 ceramic, 5-per-cent tolerance.
C_{28}, C_{29} — 100-$\mu\mu$f. ceramic.
C_{30} — 100-$\mu\mu$f. silver mica, 5-per-cent tolerance.
C_{50} — Electrolytic, 450-volt.
L_1–L_9, inc. — Wound on ½-inch diam. slug-tuned forms (CTC LS4); all coils except L_4 close-wound with No. 26 single-cotton enamel wire.
L_1 — 15 turns.
L_2, L_3 — 9 turns.
L_4 — 40 turns No. 28 single nylon enam.
L_5 — 7 turns on top of L_4 at ground end.
L_6 — 15 turns.
L_7 — 2 turns next to ground end of L_6.
L_8 — 9 turns.
L_9 — 1 turn next to ground end of L_8.
J_2 — Coaxial connector, chassis mounting.
S_5 — 8-pole 3-position ceramic rotary, shorting (see text).

different temperature coefficients for C_{41} and C_{42} to minimize the oscillator frequency drift.

The 455-kc. oscillator circuits are well shielded; this is absolutely necessary to prevent stray carrier signal from leaking through, particularly into V_7.

The top view shows a shield mounted over the mechanical filter. This was necessary to prevent

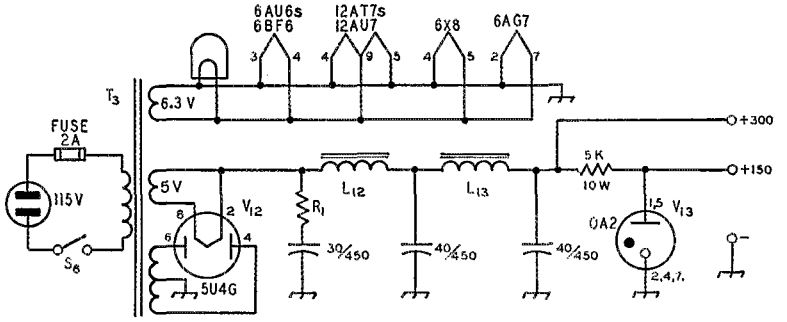


Fig. 4 — Power-supply circuit. Capacitors are electrolytic; capacitances in μf.

R_1 — 750 ohms, 20 watts (see text).
L_{12}, L_{13} — 6 henrys, 150 ma.
S_6 — S.p.s.t. toggle.
T_3 — Power transformer; 360 volts each side c.t., 150 ma.; 6.3 v., 4.5 amp.; 5 v., 3 amp.
FUSE — 5 amp., 250 volts.

if both are available. Fig. 5 is the circuit diagram of a suitable probe for use with a d.c. v.t.v.m., such as the Heathkit.

Turn the power *On*, band selector to *4 Mc.*, transmitter control to *Transmit*, frequency check *Off*, sideband switch to *Lower*, carrier level to *Minimum*, output level and audio gain to *Maximum*, and input to *300 c.p.s.* Adjust the 455-kc. oscillator by means of its tuning slug until maximum signal is obtained at the plate of V_7. Tune the primary of T_1 for maximum signal. Turn the audio gain to zero and balance out the carrier by means of the potentiometer in the plate of V_5. Advance the audio gain, keeping it below the point where the output limits due to action of the peak-clipper circuits. Now increase the oscillator frequency by means of the oscillator slug and the fine control, C_{37}, until only one sideband is passed by the filter. If an oscilloscope is used, an unmodulated r.f. signal will now be seen. If the v.t.v.m. is used, the observed signal amplitude will decrease when one sideband is tuned out, then decrease further if the carrier frequency is tuned so high that both sidebands are

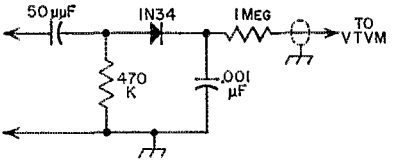


Fig. 5 — R.f. probe for use with d.c. v.t.v.m. having an input resistance of approximately 10 megohms. Resistors are ½ watt; capacitors mica.

eliminated. With a little experimenting it is easy to find the proper setting. Next, turn the sideband selector to *Upper* and tune C_{35} to eliminate the lower sideband. Turn the input selector to *1000 c.p.s.*, sideband switch to *Test* and tune C_{34} for maximum output. This places the carrier (suppressed) in the center of the passband so that both sidebands are passed. This is useful for linearity checks of the complete transmitter since it gives a two-tone test signal provided by two sidebands.

Remove V_9 from its socket. Tune the primary

(*Continued on page 128*)

60-cycle modulation of the signal because of the proximity of the power transformer. If a smaller transformer than the one shown is used it might be located far enough from the filter to make the shield unnecessary. If needed, a satisfactory shield can be made of 1/16-inch steel cut from an old chassis. It is not necessary to surround the filter completely so long as the filter cannot "see" the transformer.

A 47-ohm resistor is connected at the 6AG7 grid to stabilize this circuit. A shield passing directly over the tube socket isolates the grid and plate circuits. As shown in the bottom view this shield is made in two pieces to facilitate assembly of the bandswitch, S_5. The two forward decks of S_5 are three-pole miniature ceramic sections (Centralab PA-4) while the rear deck has two poles (Centralab PA-2). A six-inch shaft and index (Centralab PA-302) completes this assembly.

If the layout shown in the photographs is followed, and if all r.f. and low-level audio leads are kept as short and direct as practicable, no troubles with feed-back or stray coupling should be experienced.

"Tekni-Cal" transmitter decals are used for the front-panel labels. Tube designations and alignment frequencies are rubber-stamped on the chassis to facilitate alignment.

Alignment Procedure

The only instruments needed for alignment of the exciter are an oscilloscope and a v.t. voltmeter equipped with an r.f. probe. The oscilloscope should preferably have a vertical amplifier useful to at least 460 kc. The v.t.v.m. should have a full-scale sensitivity of three volts or less on the lowest scale. Either the v.t.v.m. or an oscilloscope plus an r.f. probe could do the job, but it is easier

Happenings of the Month

ELECTION RESULTS

Two new directors and five new vice-directors were elected, for two-year terms to begin January first, in ARRL elections held this autumn. Two present directors and two vice-directors were returned to office.

Gilbert L. Crossley, W3YA/W3DKN, was reelected director of the Atlantic Division, running first in a field of five. The tally:

Mr. Crossley	1011
Henry A. Blodgett, W2UTH/W2FRL	694
Alfred C. Heck, W3GEG	555
David C. White, W3FUV	426
William E. Rabenhorst, W3OHI	231

Also re-elected was vice-director **Charles O. Badgett, W3LVF.** Here the results were:

Mr. Badgett	932
Arthur W. Plummer, W3EQK	767
Warren K. Hamilton, W2FE	691
William G. Walker, W3NUG	511

The dean of the Board of Directors, Canada's **Alex Reid, VE2BE,** defeated Reginald K. Town, VE7AC, 613 votes to 412 votes, to continue his service into its 27th straight year.

Working with him as vice-director will be **William R. Savage, VE6EO,** of Lethbridge, Alberta. Licensed since 1931, Bill is a past president and vice-president of the Lethbridge Amateur Radio Club and a past honorary president of the Calgary Amateur Radio Association. He has served as QSL Manager for Alberta since 1947, and is the City Electrician for Lethbridge. He was elected with 529 votes to 479 votes for Sydney T. Jones, VE6MJ.

In the Dakota Division, **Forrest Bryant, WØFDS,** won over John B. Morgan, WØRA, 322 to 237, to carry on as vice-director.

Victor Canfield, W5BSR, returns to the Delta Division directorship after an absence of four years by totalling 309 votes. His opponents:

Mark M. Bowelle, W4CXY	295
James W. Watkins, W4FLS	212
George H. Steed, W5BUX	125
Myrlas B. Matthews, W5VAE/W5BZS	56

Vic, a Certified Public Accountant in Lake Charles, La., was previously director from 1947 to 1951. Prior to his previous terms he served as a director of the Amateur Radio Club of Southwest Louisiana. An Official Phone Station appointee and member of AREC, Vic has been licensed since 1930.

Delta's vice-director will be **Milton W. Kirkpatrick, W5KYC,** of Hattiesburg, Miss. W5KYC turned the trick with 566 votes, while his opponent, Ward Buhrman, W4QT, tallied 428 votes. Mr. Kirkpatrick is a territorial representative of the Johns-Manville Sales Corp. He has been president of the Hattiesburg Amateur Radio Club and the Gulf Coast Amateur Club, and now serves the former as secretary-treasurer. He's the emergency coordinator for Hattiesburg as well.

The new Midwest Division director is **Robert W. Denniston, WØNWX,** of Newton, Iowa, being elected by a vote of 895 to 485 for James E. McKim, WØMVG and 117 for George R. McKercher, WØMLY. Best known perhaps for his Clipperton Island expedition (FO8AJ), Bob is an emergency coordinator and member of the A-1 Operator Club. He's a past president of the Des Moines Radio Amateur Association, Newton Radio Club and Potomac Valley Radio Club. Bob is a member of a lumber firm, the Denniston and Partridge Co., of Newton.

The Midwest Division also has a new vice-director, **Sumner H. Foster, WØGQ,** who won over Albert J. Ploog, WØSCA with a 913 to 574 decision. "Sum" is a plant manager for Penick and Ford, Ltd., Inc., in Cedar Rapids, Iowa, and is serving his third term as president of the Cedar Valley Amateur Radio Club. He has done extensive work in the Civil Defense

Senior staff members help the Committee of Tellers count ballots in the director elections just concluded. Clockwise from lower left: Vice-President Noble, Treasurer Houghton, General Manager Budlong, Assistant Secretary Huntoon, Comm. Mgr. Handy, President Dosland, Director Roberts, and (back to camera) K. N. Soule, a certified public accountant.

Mr. Soule (standing right rear) supervises ARRL staff members in the work of opening first the outer, then the inner ballot envelopes preparatory to the counting of ballots in director elections. To insure complete secrecy of the vote, the outer envelopes are bundled together and removed from the room before any inner envelopes are opened.

field, writing the RACES plan for Linn County, and serving as county and area radio officer.

Harold L. Lucero, W6JDN defeated G. Donald Eberlein, W6YHM for the office of vice-director, Pacific Division, by a vote of 685 to 559. A foreman for the California Oregon Power Co., W6JDN is presently Section Communications Manager for Sacramento Valley and has just finished a term as president of the Dunsmuir Amateur Radio Club. Licensed since 1923, he makes his home in Dunsmuir, Calif.

QSL Manager **Thomas M. Moss, W4HYW** ran way ahead of two other candidates to become vice-director of the Southeastern Division. The tally was:

Mr. Moss	906
Fred W. DeMotte, W4RWM	241
William P. Sides, W4AUP	173

Tom hails from the Atlanta, Ga. area and is employed as a radio technician by the State Highway Dept. He was SCM of Georgia from 1946 to 1948, and is just finishing a tour as secretary of the Atlanta Radio Club. In addition to his W4 QSL duties, he's an EC, ORS, OPS, OBS, OO and A-1 Operator and still finds time to serve as Radio Officer for East Point, Ga.

EXAMINATION SCHEDULE

The Federal Communications Commission will give amateur examinations during the first half of 1956 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: April 7 at 8:00 A.M.
Anchorage, Alaska, 53 U. S. Post Office Bldg.: By appointment.
Atlanta, Georgia, 718 Atlanta National Bldg., 50 Whitehall St., S.W.: Tuesday and Friday at 8:30 A.M.
Baltimore 2, Md., 400 McCawley Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.
Bakersfield, Calif.: Sometime in May.
Bangor, Me.: May 16.
Beaumont, Texas, 329 P. O. Bldg.: By appointment only.
Billings, Montana: Sometime in May.
Birmingham, Ala.: March 7, June 6.
Boise, Idaho: Sometime in April.
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.
Buffalo, N. Y., 328 P.O. Bldg.: Thursday.
Butte, Mont.: Sometime in May.
Charleston, W. Va.: Sometime in March and June.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in February and May.
Cleveland, Ohio: Sometime in March and June.
Columbus, Ohio: Sometime in January and April.
Corpus Christi, Texas: March 8, June 7.
Dallas, Texas, 500 U. S. Terminal Annex Bldg.: Tuesday.
Davenport, Iowa: Sometime in January and April.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in January and April.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Texas: June 13.
Fort Wayne, Ind.: Sometime in February and May.
Fresno, Calif.: March 16, June 15.
Grand Rapids, Mich.: Sometime in January and April.
Hartford, Conn.: March 14.
Honolulu, T. H., 502 Federal Bldg.: Monday through Friday.
Houston, Texas, 324 U. S. Appraisers Bldg.: Tuesday and Friday.
Indianapolis, Ind.: Sometime in February and May.
Jackson, Miss.: March 7, June 6, 12:30 P.M.
Jacksonville, Fla.: April 14.
Juneau, Alaska, 6 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Friday, 8:30 A.M.
Klamath Falls, Ore.: Sometime in May.
Knoxville, Tenn.: March 21, June 20.
Little Rock, Ark.: January 4, April 11, 12:30 P.M.
Los Angeles, 539 U. S. Post Office and Courthouse: Wednesday, 9:00 A.M. and 1:00 P.M.
Louisville, Kentucky: Sometime in May.
Marquette, Mich.: May 9, 10 A.M.
Memphis, Tenn.: January 12, April 5.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisc.: Sometime in January and April.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday and by appointment.
Nashville, Tenn.: February 1, May 2.
New Orleans, La., 608 Federal Office Bldg., 600 South St.: Monday through Friday except Monday through Wednesday only at 8:30 A.M. when code test required.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Monday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: January 17, April 10.
Omaha, Nebr.: Sometime in January and April.
Philadelphia, Pa., 1005 U. S. Customhouse: Monday through Friday, 8:30 A.M. to 2 P.M.
Phoenix, Ariz.: Sometime in January and April.
Pittsburgh, Pa.: Sometime in February and May.
Portland, Maine: April 10.
Portland, Ore., 433 U. S. Courthouse: Friday, 8:30 A.M. for 20- and 13-w.p.m. code tests.
Rapid City, S. D.: May 26, 8 A.M.
Roanoke, Va.: April 7.
St. Louis, Mo.: Sometime in February and May.
St. Paul, Minn., 208 Federal Courts Bldg.: Friday, 8:45 A.M.
Salt Lake City, Utah: March 17, June 16, 11 A.M.
San Antonio, Texas: February 9, May 3.
San Diego, Calif., 15-C U. S. Customhouse: By appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Thursday, and Monday through Friday at 8 A.M. if no code test required.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: March 14-15, June 13-14, 9 A.M. and 1 P.M.
Seattle, Wash., 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: March 14, June 13, 10 A.M.
Spokane, Wash.: Sometime in May.
Syracuse, N. Y.: Sometime in January and April.
Tampa, Fla., 410 P. O. Bldg.: By appointment.
Tucson, Ariz.: Sometime in April.
Tulsa, Okla.: February 14, May 15.
Washington, D. C., 415 22nd St., N.W.: Monday through Friday, 8:30 A.M. to 5 P.M.
Wichita, Kansas: Sometime in March.
Williamsport, Pa.: Sometime in March and June.
Wilmington, N. C.: June 2.
Winston-Salem, N. C.: February 4, May 5.

NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining points listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

RTTY FILING

The League has filed the following statement with FCC in the matter of our request that the amount of permissible frequency shift in RTTY communication be not limited to the 800-900 cycle range but rather that any shift less than 900 cycles be allowed:

(Continued on page 130)

Conelrad Compliance

Suggestions for Observance of Rules on Radio Alerts

BY GEORGE GRAMMER, W1DF

• Under the just-adopted Conelrad rules, not later than January 2, 1957, you'll be faced with the necessity for keeping track of doings on the broadcast bands. The ideas outlined here will ensure compliance. Bear in mind that Conelrad is distinct from Civil Defense activities, and that any arrangements leading to your being warned by CD, in the event of an emergency, do not constitute compliance with the Conelrad rules unless specifically authorized by FCC.

AMATEURS are obliged to shut down, along with other services not specifically authorized to operate, when a Conelrad Radio Alert is in force, and the new rules [1] spell out the means by which we are expected by next year, to inform ourselves of the fact that an Alert is on.

The pertinent section will be §12.192, which reads as follows:

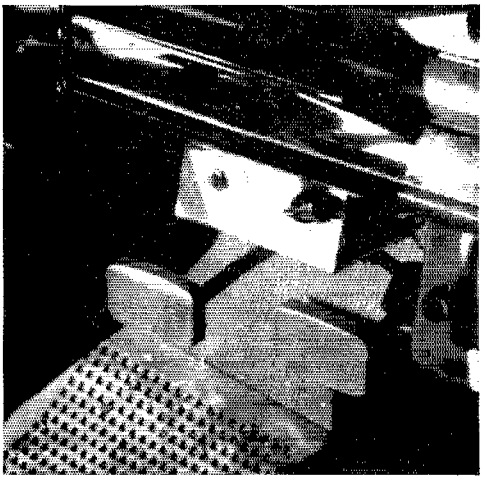
> §12.192 Reception of RADIO ALERT. (a) The licensee of a station in the Amateur Radio Service is required to provide a means for reception of the CONELRAD RADIO ALERT or a means for the determination that such ALERT is in force.
>
> (b) All operators of stations in the Amateur Radio Service will be responsible for the reception of the CONELRAD RADIO ALERT or indication that such ALERT is in force by:
>
> (1) Reception of a CONELRAD RADIO ALERT MESSAGE which will be broadcast by each standard, FM and TV broadcast station on its regular assigned frequency before they leave the air; or
>
> (2) reception of standard broadcast stations operating under CONELRAD requirements during the period of the ALERT on 640 or 1240 kc.; or
>
> (3) determing that an ALERT is in force by lack of normal broadcast station operation (observations made before amateur station operation is begun and at least once every ten minutes during operation thereafter will be considered as sufficient for compliance with this Section); or
>
> (4) other means if so authorized by the Federal Communications Commission.

About all you have to know about Conelrad as applied to broadcast stations is that (1) every such station will broadcast the Conelrad Radio Alert, when received, and then close down on its regular frequency, and (2) those standard-band stations that operate in the Conelrad network will then immediately shift to either 640 or 1240 kc. to continue the transmission of information of use to the public. Except for paragraph (4) under section (b), amateur compliance with Conelrad rules is based on monitoring broadcast stations in one way or another. There is no specific information as to what paragraph (4) might mean, and it will probably be a case of judging each suggestion on its merits. So let's take the first three numbered paragraphs in order:

Reception of the Alert Message

Paragraph (1) obviously requires continuous monitoring of a broadcast station during your periods of operation, since there is no way of anticipating the Alert. This can be done by the simple process of having a b.c. receiver in the shack and letting it run while you're on the air. Having to listen to it is likely to be annoying, though, and it is certainly not desirable to have a b.c. program as background during voice transmissions, where it might be construed as rebroadcasting.

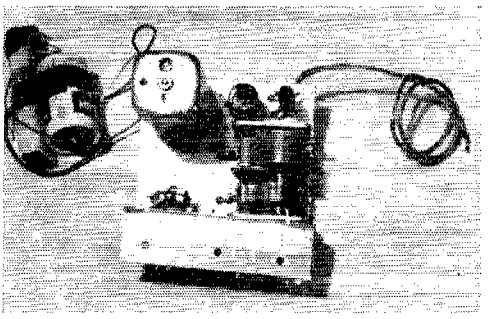
Actually, paragraph (1) could be given the broad interpretation, if the powers that be are inclined to be liberal, that compliance would be served by the reception of the message by anyone in the household, provided arrangements are made for the information to be given immediately to the operator of the amateur station. There is no such present interpretation, however, and the thought is introduced simply to suggest that any reasonably-certain methods of compliance within the spirit, if not the actual language, of the rule at least ought to get an audience.



W4CU's Conelrad converter installed under the dash alongside the ham-band converter. This is a battery-operated one-tube unit using the circuit of Fig. 1.

The de luxe way of operating under (1) is to have an automatic alarm system. The Conelrad Radio Alert Message is preceded by a distinctive warning signal which can be used to actuate a buzzer, light, or other form of audible or visible

[1] Docket No. 11488, August 31, 1955. See "Happenings," *QST*, October, 1955, page 47.



The W4CU converter is built on a bent piece of aluminum as a chassis. The output tuned circuit is on the underside. Any convenient form of construction may be used.

indicator. With such a system you don't have to listen to the b.c. station's output. A circuit for the purpose was described in *QST* some time ago.[2]

Reception During an Alert

This, too, requires continuous monitoring, but (2) differs from (1) in that you monitor either 640 or 1240 kc. so you'll catch the b.c. stations when they move on to those frequencies. Offhand, it doesn't seem as though there's much to be gained if the monitoring is to be done by continuous listening. Although there may be no program material on those frequencies in your locality, there will undoubtedly be noise and static, both man-made and natural, so the annoyance factor would seem to be just as great.

There is a reasonable prospect of making a simple automatic alarm for compliance under this paragraph, if either 640 or 1240 is relatively free of r.f. energy in your vicinity. The alarm can be any form of carrier-operated device that will respond when a station appears on the frequency but that will be inoperative in the absence of a station. A simple "S"-meter arrangement such as one of those shown in the receiver chapter in the *Handbook* would be sufficient. The sound could be cut off by a shorting switch across the speaker voice coil. When the meter shows the presence of a carrier, it's time to unshort the speaker and listen.

A more elaborate arrangement would be a squelch circuit, which might take the form of a d.c. amplifier, operated by a.v.c. voltage, having a normally-closed relay in its plate circuit. The contacts could short-circuit the voice coil under ordinary air conditions, but would open when a carrier coming on the frequency generated a desired level of a.v.c. voltage.

Paragraph (3)

This paragraph probably will appeal to most of us as being the easiest method. The simplest thing, of course, would be to have a b.c. receiver running continuously, with the volume control normally off but turned up manually at ten-minute intervals for the required check.

[2] Lindsey, "An Auto-Alarm Unit for 'Conelrad'," *QST*, September, 1953.

However, (3) does not require actual *listening* to some broadcast station at ten-minute intervals; a visual indicator may be substituted for aural monitoring. Anything that will show a departure from the normal operation of a broadcast station will suffice. The "S"-meter scheme mentioned above will be adequate, at least in those localities where there is a station sufficiently close by to give a consistent and unmistakable reading. A glance at the meter at ten-minute intervals will show whether the station is operating as usual, and the absence of a normal reading will indicate the necessity for turning up the volume to see what is going on. The same squelch system previously suggested also could be used to operate a relay that would turn on a warning light or some noise-making device, if an automatic system is wanted.

There is one serious defect in such an indicator if you're a night owl and do your operating when the local b.c. stations are closed down — it won't work when your "beacon" station isn't on the air. In such a case there would seem to be no alternative to tuning around the broadcast band to keep tabs on the status of things.

The Receiver Question

Maybe you don't have a spare broadcast receiver and don't care too much for the idea of investing in one. In that case the junk box may turn up some of the parts you need for a simple

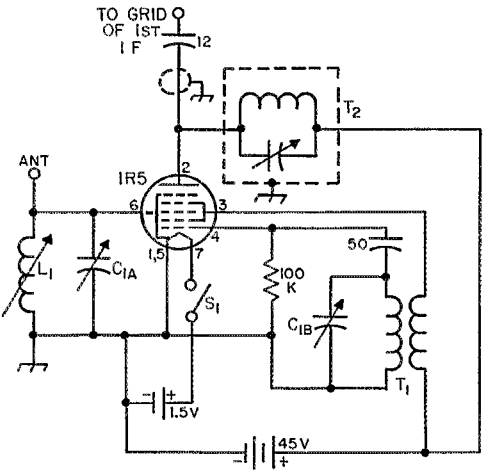


Fig. 1 — Converter circuit for monitoring b.c. stations.

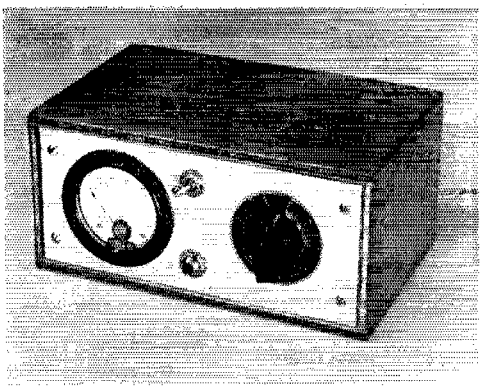
C_{1A}, C_{1B} — Two-gang broadcast capacitor, oscillator section according to intermediate frequency to be used.

L_1 — Loop stick.

T_1 — B.c. oscillator transformer (for i.f. to be used).

T_2 — I.f. coil and trimmer. This can be taken from an i.f. transformer, or the transformer can be used intact, the output being taken from the secondary.

Note: If only one broadcast station is to be monitored C_{1A} and C_{1B} can be padder-type capacitors (or a combination of padding and fixed capacitance as required) adjusted for the desired station and intermediate frequencies. A 6BE6 may be substituted for the 1R5 for a.c. operation; S_1 may be connected in the cathode lead in such case.

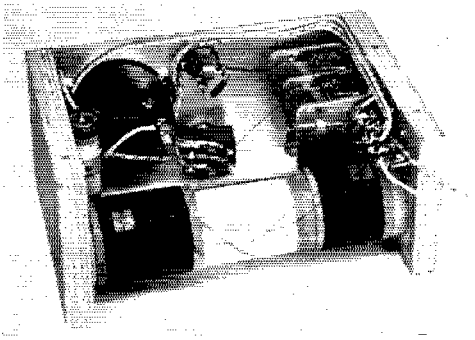


Visual monitor using a crystal detector and transistor d.c. amplifier. It is also useful as an emergency broadcast set for headphone reception. The switch transfers the headset from transistor to crystal, opening the battery circuit in the crystal position. The aluminum panel is 7 by 3 inches and the box, made from ¼-inch plywood, is 5 inches deep.

converter that will do the trick. All that is necessary is a one-tube job that will work from the b.c. band into whatever intermediate frequency your communications receiver happens to use.

Fig. 1 is the circuit of a battery-operated converter devised by Ralph J. Renton, W4CU (who is U. S. Supervisor for Conelrad) and used by him both mobile and at home. Battery operation makes it very convenient for use either in the car or fixed station since the batteries are self-contained. The batteries last a long time because the unit is turned on (by closing S_1) only at ten-minute intervals for a quick check. Those who don't like batteries can easily substitute an a.c. tube such as the 6BE6 and make the obvious changes in the heater-cathode wiring. In that case the power can be taken from the receiver with which the converter is used. W4CU states that it has plenty of sensitivity with a two- or three-foot whip antenna when working into his car broadcast receiver, which is used as an i.f. for a ham-band converter.

The model shown in the photographs is tunable and is designed for mounting under the dashboard of the car, but another model has been built using fixed-tuned circuits — a perfectly satisfactory arrangement where one local b.c. station will suffice. The signal is introduced into the receiver's i.f. system by wrapping a wire around the grid pin of the first i.f. tube. The 12-$\mu\mu$f. capacitor is small enough to have no marked effect on the tuning of the i.f. grid circuit, but an even smaller capacitance probably will suffice if the b.c. signal is reasonably strong. The circuit constants will depend on the i.f. — 455 for most communications receivers and 262 for most car b.c. sets. Double-conversion communications receivers that have low-frequency (50 to 100 kc.) second i.f. channels usually have the first i.f. in the vicinity of 1600 kc., which is probably the more convenient of the two frequencies for inserting the signal.



The coils in the transistorized monitor can be slid back and forth along the slotted cardboard tube to change the coupling and hence the selectivity. The 1N34A crystal and 2N107 transistor are mounted on a 5-terminal tie-point strip, two terminals of which have leads for antenna and ground soldered to them. C_2 is out of sight behind the tie-point strip. The battery is a penlite cell. This assembly slides inside the box shown in the front view.

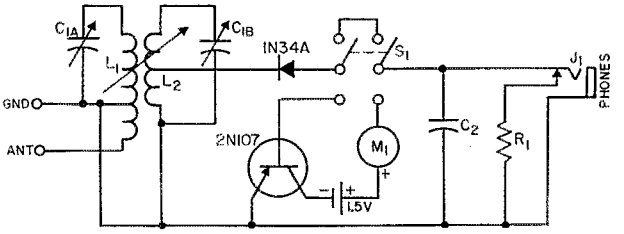


Fig. 2 — Transistorized crystal receiver for visual monitoring.

C_{1A}, C_{1B} — Two-gang broadcast capacitor, 365 or more $\mu\mu$f. per section, with padders.

C_2 — 470-$\mu\mu$f. mica or ceramic.

R_1 — 1500 ohms, ½ watt. Use 1500 ohms for each 1.5-volt dry cell, if more cells are used.

L_1 — 110 turns No. 28 enam. close-wound on 1⅝-inch diameter form; ground tap at 30th turn.

L_2 — 80 turns No. 28 enam. close-wound on 1⅝-inch diameter form; detector tap at 25th turn from ground end.

J_1 — Closed-circuit jack.

M_1 — 0–1 d.c. milliammeter.

S_1 — D.p.d.t. toggle.

Note: Undistorted audio output increases with battery voltage.

For a continuous visual indication, provided there is a local b.c. station handy, the circuit of Fig. 2 not only works but also offers the novelty of building a crystal set and getting acquainted with a simple transistor application. Aside from the 1-mil meter, which is needed anyway for a visual device, it costs even less than a simple converter. As crystal sets go, it is fairly "elaborate," principally because it uses two inductively-coupled tuned circuits for the sake of selectivity.[3]

(*Continued on page 134*)

[3] The use of a transistor audio amplifier for headphone output following a crystal detector has also been suggested by W7OUV, who used a single tuned circuit, directly connected to the antenna. A simple arrangement of this type will suffice in localities where higher selectivity is not required.

Hints and Kinks For the Experimenter

MOBILE-TRANSMITTER METERING HINT

THE circuit shown in Fig. 1 utilizes a simple d.p.d.t. toggle switch to perform several mobile-transmitter switching operations. One half of the switch is used to connect a d.c. milliammeter into either the grid or the cathode circuit of a power-amplifier tube. Simultaneously, the other section of the switch selects either the receiver or the transmitter power supply as the source of plate voltage for the oscillator-driver tube.

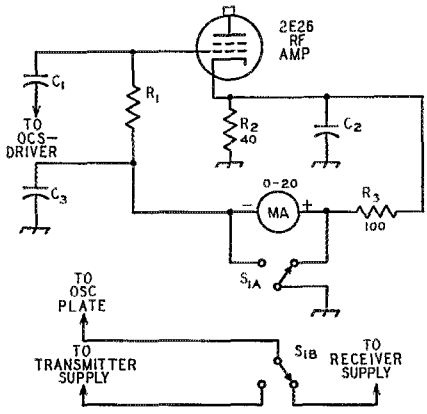


Fig. 1 — Circuit diagram of the meter switching system suggested by WØCIR.

When S_1 is in the position shown in the diagram, and with the transmitter power supply turned off, the oscillator will take power from the receiver supply and the meter will indicate amplifier grid current. This arrangement is ideal for tune-up or zeroing-in adjustments because it leaves the r.f. amplifier without plate power. In the second position, S_1 connects the meter into the amplifier cathode circuit, and returns the oscillator plate circuit to the transmitter power supply.

The series resistor, R_3, prevents the low-resistance of the milliammeter from shorting out the voltage developed across the amplifier cathode resistor, R_2. Of course, it also divides the cathode current path with the result that the meter registers appreciably less than the total cathode current. However, this presents no problem once the meter has been checked and calibrated against a direct reading. The latter may be made by shorting R_3 and reading total cathode current with an appropriate milliammeter. R_3 has no part in the grid-circuit operation and a direct reading of amplifier grid current is therefore registered by the 0-20-ma. meter.

The component values shown in Fig. 1 are used with a 2E26 final. A little arithmetic will show that the effective value of cathode resistance (for the amplifier) is reduced to less than 30 ohms when the meter is switched over to the final and, as a result, the system causes no appreciable drop in amplifier plate voltage. C_1, C_2, C_3 and R_1 are typical amplifier components.

— *Harry Hawkins, WØCIR*

USING A BROADCAST RECEIVER AS A CODE-PRACTICE OSCILLATOR

MEMBERS of the Raritan Bay Radio Amateurs, in working with would-be amateurs or Novices who are pulling up their code speed, find that an a.c.-d.c. broadcast receiver (any type) makes an extremely effective and simple code-practice oscillator. To convert the receiver for code work, merely connect a capacitance of 0.001 to 0.05 μf. between the plate of the audio output tube and the volume control. If the capacitor is properly connected at the volume control end, it is possible to vary the volume and pitch of the audio tone. The telegraph key may be hooked in series with either the capacitor (at the volume-control end) or the voice coil.

— *Luke F. McCloud, K2DDM*

IMPROVING THE "IMPROVED" BLEEDER CIRCUIT

THE one objection to W9LQE's improved bleeder circuit (see page 54, *QST*, August, 1955) is that the bleeder becomes inoperative in the event that the meter opens up. This possibility can be avoided by borrowing a trick employed in the metering circuits of some commercial transmitters. The use of one additional resistor, R_3 of Fig. 2, does the trick.

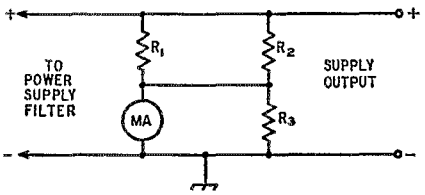


Fig. 2 — The addition of R_3 to the original "Improved Bleeder Circuit" provides additional protection.

The resistance of R_3 should be high enough to prevent any practical effect on the calibration of the meter. The wattage rating of the resistor must be in keeping with the power to be dissipated in the event of meter failure.

— *Neil Johnson, W2OLU*

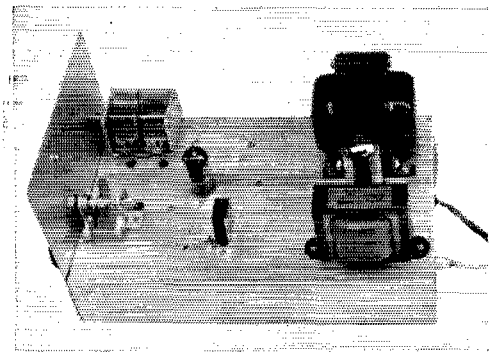
A Selective Converter for 80 and 40 Meters

Boosting the Performance of Low-Priced Receivers

BY LEWIS G. McCOY, W1ICP

• Many amateurs who start their careers with inexpensive "communications" receivers find themselves handicapped when they first get on the air because their receivers are lacking in selectivity and bandspread. This simple converter, described by W1ICP, will provide better tuning and single-signal c.w. reception for less than $20.

HARDLY A WEEK goes by that some Novice doesn't write Hq. asking for help in improving the selectivity and bandspread of his receiver. This is understandable, because many of the lower-priced receivers are quite restricted in the amount of bandspread and selectivity available. Probably the best approach to improving performance of this type of receiver is with a converter. By using a converter, no modifications of the receiver are necessary, since all connections are made externally. By using the converter to be described, it is possible to step up the performance of a poor receiver to a point where the Novice can tune and separate stations with much more ease than previously. However, it should be pointed out that the converter is not



The input capacitor is the dual section unit at the upper left-hand corner. The crystal and slug for L_6 are near the center at the foreground edge.

designed to make a communications receiver[1] out of a broadcast set. To do that would mean complete rebuilding of the b.c. set, a project not worth the effort and expense involved.

Circuit Details

As can be seen in Fig. 1, the only tube used in the converter is a 6U8 (plus the power-supply rectifier). The 6U8 is a dual-section job, the pentode section serving as the mixer and the triode portion as the oscillator. So that the Novice can understand what is taking place in the converter, a brief explanation follows.

The 6U8 oscillator tunes from 5200 to 5700 kc., and its frequency at any given time depends upon where its tuning capacitor is set. The receiver following the converter is always tuned to 1700 kc., accepting any signal at this frequency and rejecting others. The r.f. of the oscillator combines in the mixer with any incoming signals from the antenna. When two signals are combined in the mixer circuit (considering the r.f. from the oscillator as one signal), the output of the mixer includes the *sum*, and *difference*, frequencies of these two signals. Thus, if the oscillator is set at 5500 kc. and the incoming signal is 3800 kc., the difference frequency is 1700 kc. (5500 − 3800 = 1700), and a duplicate of the original 3800-kc. signal now appears at 1700 kc., to be amplified and handled in the normal fashion by the receiver tuned to 1700 kc. Under these same conditions, an incoming signal at 3750 kc. appears at 1750 kc. in the converter output (5500 − 3750 = 1750) and is not accepted by the receiver tuned to 1700 kc. To receive the 3750-kc. signal, it is necessary to tune the oscillator to 5450 kc. (5450 − 3750 = 1700).

Read that over once again if you didn't get it the first time, because now another thought must be introduced. If the incoming signal were on 7200 kc., the mixer output would again include a signal at 1700 kc. (7200 − 5500 = 1700). Thus it looks as though the receiver might be capable of receiving signals on both 80 and 40 meters at the same time, but it isn't. Depending upon the frequency to which the input circuit of the mixer is tuned, one signal can be accepted and the other rejected, so listening on 80 or 40 depends upon the setting of C_1. Just where we listen in the band depends upon the setting of the oscillator tuning, C_3. Your present superheterodyne receiver uses the same basic principle, except that when the band is changed, the input and oscillator frequencies are both changed. By selecting an output frequency of 1700 kc., and confining operation to 80 and 40 meters, only the input circuit has to be changed, and the two bands are covered in this converter by a single capacitor. Two tuned circuits are used between antenna and mixer to insure that signals from the unwanted band are rejected.

A large amount of selectivity is gained by feeding the output from the mixer through a 1700-kc. crystal. By using the converter with the crystal circuit, we can improve the performance

[1] *A communications receiver can be defined as one having a beat-frequency oscillator and manual gain control. Usually, some form of bandspread is incorporated into the receiver. The b.c. set usually has none of these features.*

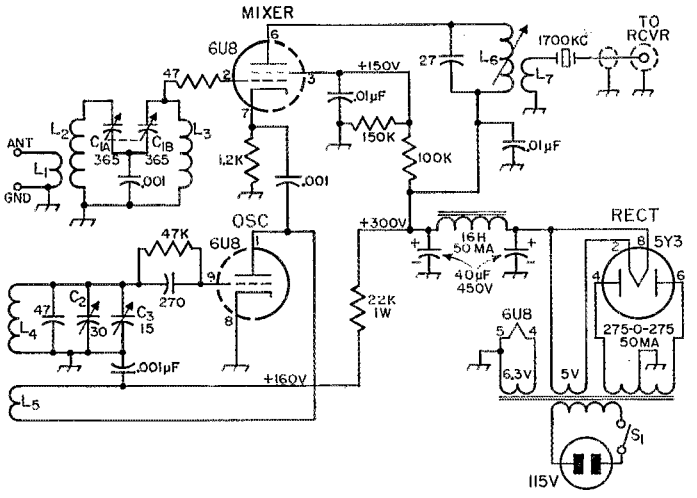


Fig. 1 — Circuit diagram of the 80- and 40-meter converter. All capacitances given in μμf. unless otherwise noted.
C_1 — 365-μμf. dual variable, t.r.f. type.
C_2 — 3–30-μμf. trimmer.
C_3 — 15-μμf. variable (Bud 1850, Cardwell ZR-15AS, Millen 20015).
L_1, L_2, L_3, L_4, L_5 — B & W No. 3016 Miniductor, 1-inch diameter, 32 turns per inch, No. 22 wire, cut as below.
L_1 — 8 turns separated from L_2 by one turn (see text).
L_2, L_3 — 19 turns.
L_4 — 21 turns separated from L_5 by one turn.
L_5 — 8 turns.
L_6 — 105–200-μh. slug-tuned coil (North Hills Electric 120H).
L_7 — See text.
Crystal — 1700 kc. (E. B. Lewis Co., type EL-3).

of a receiving system to a remarkable degree, at least on 80 and 40 meters.

Construction

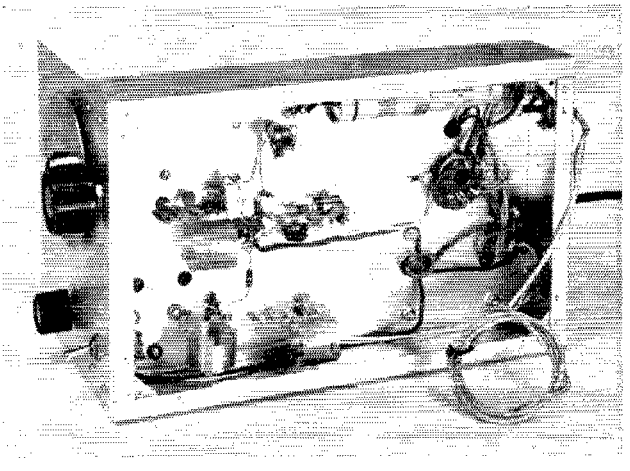
The unit shown in the photographs was built on a 7 × 11 × 2-inch aluminum chassis. The front panel was made from a 6 × 7-inch piece of aluminum. The power supply is mounted to the rear of the chassis and the converter components are in the center and front. The layout shown in the bottom view should be followed, at least for the placement of L_1, L_2, L_3 and L_4.

The input and oscillator coils are made from a single length of B & W Miniductor stock, No. 3016. Count off 31 turns of the coil stock and bend the 32nd turn in toward the axis of the coil. Cut the wire at this point and then unwind the 32nd turn from the support bars. Using a hacksaw blade, carefully cut the polystyrene support bars and separate the 31-turn coil from the original stock. Next, count off 9 turns from the 31-turn coil and cut the wire at the 9th turn. At the cut unwind a half turn from each coil, and also unwind a half turn at the outside ends. This will leave two coils on the same support bars, with half-turn leads at their ends. One coil has 21 turns and the other has 8 turns, and they are separated by the space of one turn. These coils are L_4 and L_5.

The input coils L_1 and L_2 are made up in the same manner. Standard bakelite tie points are used to mount the coils. Two 4-terminal tie points are needed for L_1L_2 and L_4L_5, and a one-terminal unit is required for L_3. The plate load inductance L_6 is a 105–200 μh. variable-inductance coil (North Hills 120H). The coupling coil L_7 is 45 turns of No. 32 d.c.c. scramble-wound adjacent to L_6. If the constructor should have difficulty in obtaining No. 32 wire, any size small enough to allow 45 turns on the coil form can be substituted.

The input capacitor, C_1, is a 2-gang t.r.f. variable, 365 μμf. per section. As both the stators and rotor must be insulated from the chassis, extruded fiber washers should be used with the

(Continued on page 130)



Bottom view of the converter showing placement of parts. The coil at the lower left is L_3, and the input coil, L_1L_2, is just to the right of L_3. The oscillator coil, L_4L_5 is at the left near the center. The output coil, L_6, is near the top center.

Interpolation Frequency Measurements with the BC-221

Simple Modification for Increased Accuracy

BY CHARLES L. RILEY, JR.,* W1JJY

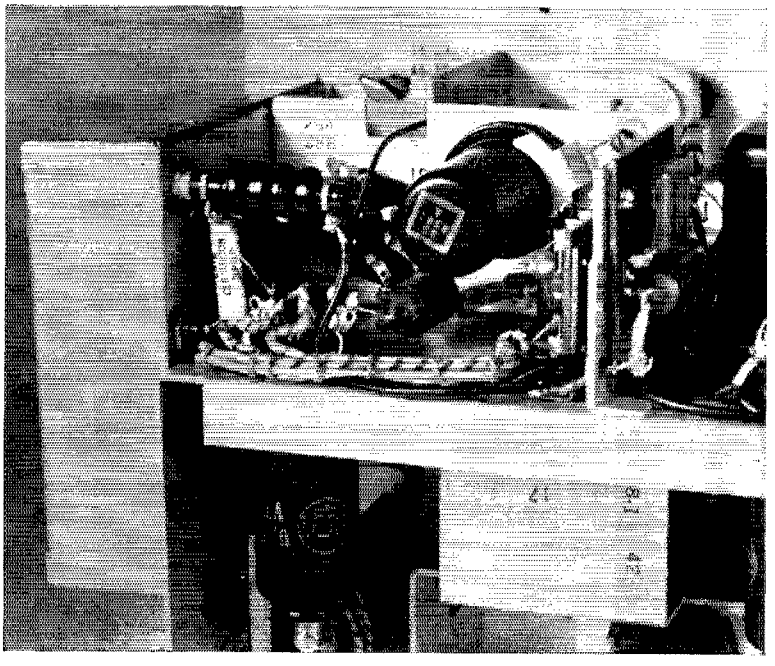
• Although the BC-221 and LM frequency meters "as is" have an enviable record for accuracy, the small change described in this article can increase the precision of measurement tenfold or more. The cost is practically nothing and the modification takes very little time. The calibration is unaffected.

THE accuracy of frequency measurement with the BC-221 Frequency Meter or its LM equivalents can be increased considerably by a very simple modification that converts it into an interpolation-type meter. The principle is as follows:

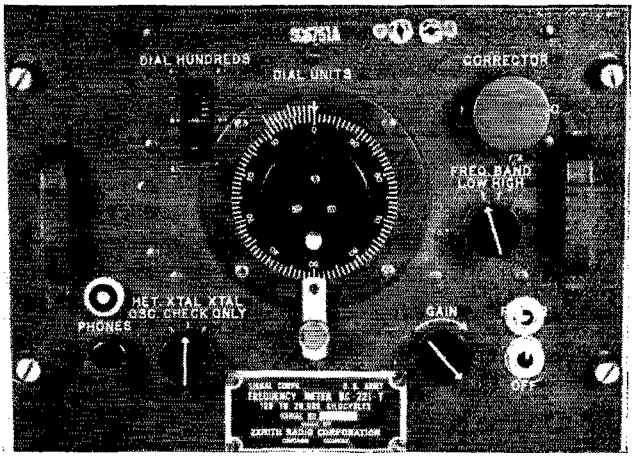
The BC-221 uses a multigrid tube to mix r.f. inputs from the 1-Mc. crystal standard oscillator and the calibrated VFO to obtain an audio-frequency beat used in the "check point" procedure. The same tube and circuit can produce sums and differences as r.f. outputs, if an appropriate r.f. plate load and coupling circuit is provided. Then the crystal fundamental and its harmonics will be mixed with the VFO fundamental and its harmonics in such a way that the integral megacycle value of any output frequency will be controlled by the crystal, while the VFO provides the fractional-megacycle component of the output. Thus the VFO operates on the low-frequency ranges, where the calibration is given for each one-tenth kc. of the fundamental, and the accuracy can be increased by a factor of 10 or more, depending on the output frequency range and the exact output frequency. The original "Function" switch now determines the mode of operation: "Normal" in the "HET OSC" position; "Heterodyne" in the "XTAL CHECK" position. The new output terminal is used for both modes, with the "mixer" tube acting as a harmonic amplifier when operating in the "Normal" mode.

Since several frequencies are generated simultaneously by this method, it is necessary to know the frequency with moderate accuracy before the final check is made. The preliminary check can be made by the normal procedure. For example, suppose that the frequency of a signal, as measured to the nearest kilocycle, is 3621 kc. when the high-frequency VFO range is used. On switching to the low range as described above, the low-frequency section of the calibration book should

* % Westinghouse Electric Corp., Air Arm Division, Friendship International Airport, Baltimore 27, Md.



In the modified BC-221 at W1JJY the added r.f. choke is mounted on the small aluminum shield at the left, with the output coupling capacitor and feed-through just below it, but any convenient mounting arrangement could be used. (The shield shown was installed to provide mounting space and shielding for r.f. buffer/amplifier stages, a project that was abandoned in view of probable excessive heating of the frequency-meter chassis.)



The r.f. output terminal is a microphone-type connector mounted at the left near the bottom of the handle. Other modifications that have been made to the meter are not a part of this article, but are mentioned briefly in the text.

be consulted for the dial setting in the neighborhood of 621 kc. (3621 kc. minus 3 Mc., the next-lowest integral multiple of 1 Mc.) and the dial turned to that vicinity. When the frequency-meter signal is heard and tuned to zero beat, it may be found that the indicated frequency is 621.2 kc., so that the actual frequency is 3 Mc. plus 621.2 kc. or 3621.2 kc. The usual process of

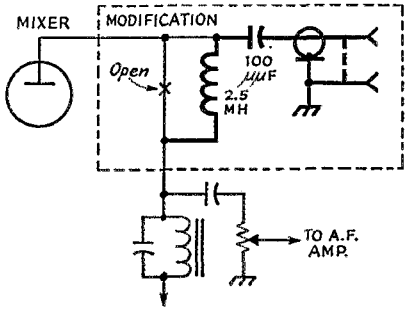


Fig. 1 — Simple modification of BC-221 or LM-series frequency meters to convert the instrument to an interpolation-type meter. The conventional method of operation can still be used.

interpolation can be used for frequencies lying between the 0.1-kc. intervals listed in the book.

The same result would be obtained with twice the accuracy by taking the *difference* between 4 Mc. and the appropriate low-frequency figure. Thus 4000 kc. minus 3621 kc. is 379 kc., and the frequency-meter signal also should be heard when the meter is adjusted, on its low-frequency range, to the vicinity of 379 kc. Confusion as to whether the sum or difference is being used can be eliminated by the procedure described above, except near check points. There the audio beat seems to modulate all RF outputs, making it difficult to discern the desired zero beat. It is sometimes possible to choose a different combination of crystal and VFO frequencies giving the same output with less interference from audio beats.

The modification is merely to insert an r.f. choke (one from the junk box will do, since the inductance is not critical) in series with the mixer plate lead at the tube socket. Then a small r.f. coupling capacitor from mixer plate to an output terminal completes the job. The revised circuit is shown in Fig. 1.

To obtain full benefit of the increased accuracy, adjust the 1 Mc. crystal frequency accurately to WWV. Most, but not all, models of the 221 have an internal trimmer.

CAUTION: Be extremely careful that no metal chips, filings, or other particles fall into the worm drive during drilling or cutting operations.

The photographs show how the author installed these components in his BC-221, and also the output connector on the front panel. Other modifications made to the 221 are also visible on the panel, although not the concern of this article. They include a 50,000-ohm potentiometer (just below the r.f. output connector) used as an r.f. output attenuator, and an extra phone jack (at the right) in the VFO grid-return circuit for reading grid current or for blocked-grid keying when the 221 is used to drive a transmitter. The crystal socket at the top connects to the VFO tank capacitor to permit using the VFO as a grid-dip meter or, after calibration in terms of capacitance change against dial readings, as a precision capacitance meter.

FEEDBACK

W8MNX reports that when he tried to buy the modulation transformer for the six-meter 50-Mc. rig for the beginner, described in the July *QST*, he found that the A-3003 specified was a vertical oscillator transformer. The number for T1, page 30, should therefore have been A-3008.

—···—

Gordon Lauder, W9PVD, author of "A Four Band S.S.B. VFO," which appeared in the July *QST*, calls attention to the fact that the oscillator grid resistor in the drawing on page 12 is marked .01 meg. and that it should have been 0.1 meg. or 100K.

T-Match for a Three-Band Vertical

Multiband Antenna System for Coax Feed

BY THOMAS G. BANKS, JR.,* W5HJ

• **Forty-four feet represents the maximum vertical-antenna height that should be used for low-angle radiation on 14 Mc. and thus establishes a maximum dimension for a simple multiband vertical. This article describes a matching system that has worked well in a number of installations, despite probable variations in ground resistance and the impedance changes that accompany different types of antenna construction.**

THIS is a description of the matching system used with a 44-foot vertical for 20-, 40-, and 75-meter operation. The antenna consists of a 32½-foot guyed TV tower, with an 11½-foot mast extension on top to obtain the 44-foot total height. The ground radials are four 32-foot water pipes spaced 90 degrees around the tower base, and buried to a depth of 8 inches. These pipes feed four rainbird-type sprinkler heads, and serve the additional purpose of watering the grass in the back yard. The ground lead to the match box ties into the valve manifold for the sprinkler controls about 6 inches from the base.

Before attempting to design the antenna tuner numerous impedance measurements were made to determine the optimum conditions for the various bands of operation with the backyard soil in both damp and dry condition. These measurements are given in Table I, together with measurements on several other types of antennas that may be of interest. All measurements were made with a General Radio type 916-A r.f. bridge, recalibrated several times during the measurements to maintain accuracy.

From these measurements the mean impedance for each band was calculated to be as follows:

14 Mc. — $Z_a = 82 - j66$ ohms
7 Mc. — $Z_a = 160 + j165$ ohms
3.5 Mc. — $Z_a = 16 - j120$ ohms

The first term is the antenna resistance, and the "j" term is the reactance. The negative sign means that the antenna is capacitive and requires series inductance to obtain resonance. The positive sign means the antenna is inductive and requires series capacitance to obtain resonance.

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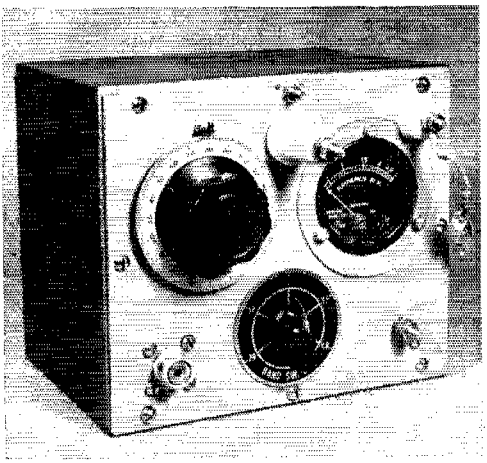


W5HJ's "match box" is 6 inches high by 7 inches wide by 6 inches deep. Any larger size may also be used. All components are mounted on the aluminum panel. The clip lead is for shunting the r.f. meter on 3.5 Mc., where the low radiation resistance makes the current large with 250 watts of r.f.

The "T" network used here is a quarter-wave matching system in lumped-constant form instead of the quarter-wave coax section many have no doubt used at one time or another. The match box also has built-in compensation for the antenna reactance, which a quarter-wave coax section would not have.

Originally it was intended to include enough information for designing any kind of a tuner for any of the antennas listed in the impedance measurements table, but it was discovered that many people didn't know the difference between impedance, resistance, and reactance. A builder should have no trouble with this match box if it is used with an antenna similar to this antenna and the antenna power is no more than 250 watts. Those engaged in antenna work professionally should have no trouble in designing a match box for any of the other antennas listed, as the impedance measurements shown will be all the information necessary as a starting point.

The circuit diagram of the network is shown in Fig. 1. If the antenna impedance were a pure resistance in each band of operation the reactance-compensating elements, C_3 and L_3, would not be necessary in the circuit and L_1 would be equal to L_2. This cannot be the case with a multiband vertical, so C_3 and L_3 must be used to compensate for antenna reactance.

RFC_1 and R_1, shown connected from the antenna to ground, are for bleeding static off the tower to prevent a build-up which could burn out the other components.

The clip-lead shown in Fig. 1 is for shunting the r.f. meter during 75-meter operation. I run 250 watts into the antenna, and this will cause the 3-amp. antenna meter to go off scale unless it is shunted. This clip-lead is shown in the front-view photograph. (Of course, if you have a 5-amp. meter it won't go off scale so easily.) The rear-

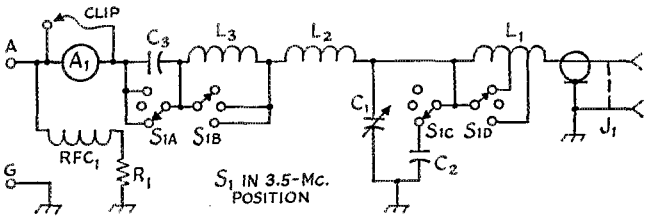


Fig. 1 — "T" matching network for 52-ohm coax to a 44-foot vertical antenna used on 3.5, 7, and 14 Mc.

C_1 — 350-$\mu\mu$f. variable, 1000 volts (see note).
C_2 — 0.00125-μf. mica, 2000 volts.
C_3 — 150-$\mu\mu$f. mica, 2500 volts.
R_1 — 10,000 ohms, 10 watts, wire-wound.
L_1 — 12 turns, 1-inch diam., 8 turns per inch, tapped 4 and 5¾ turns from C_1 end.
L_2 — 10 turns, 1-inch diam., 8 turns per inch.
L_3 — 22 turns, 1-inch diam., 8 turns per inch (see note).
A_1 — 0-3 r.f. ammeter.
J_1 — Coax receptacle.
RFC_1 — 2.5 mh.
S_1 — 4-pole ceramic rotary, 3 positions used. Coils are B & W Miniductor No. 3014.

NOTE: If c.w. operation only desired on 3.5 Mc., increase C_1 to 500 $\mu\mu$f. and add a coil same size as L_2 in series with L_3, but not inductively coupled to L_3.

view photograph (page 42) shows the layout used to achieve the compactness required in the small cabinet. Note that the three coils, L_1, L_2, and L_3, are spaced and oriented so there is a minimum of coupling between them.

All the components called for in Fig. 1 are standard items. The ganged wafer switch shown in the photograph uses special sections to accomplish the switching shown in Fig. 1, but a standard switch of the type specified will do just as well. For 20 meters, L_1 (tapped down 5¾ turns), L_2, and C_1 are used while C_3 and L_3 are both shorted and C_2 is not connected. For 40 meters, the taps

(*Continued on page 136*)

TABLE I

Impedance Measurements on Various Antenna Types

Freq. Mc.	*44′ × 9″ guyed TV tower; 4-32′ radials*	*43′ guyed 1½″ mast, nylon guys; 4-28′ ground radials* [1]	*40′ × 8″ gutter pipe; 4-32′ radials*	*30′ × 8″ gutter pipe; 8-30′ radials*	*Inverted "L"; 60′ horizontal; 27″ vertical; 30″ ground rod*	*Master Mount whip on '54 Mercury 2-door, left rear fender* [2]	*Master Mount whip on '51 Packard 4-door sedan, rear bumper* [3]
1.9	2 − *j*326	18 − *j*527	90 − *j*368 [4]				
3.6	12.5 − *j*143	22 − *j*209	20 − *j*172				
3.75	16 − *j*133	24 − *j*168	21 − *j*149	14 − *j*240			17 − *j*320
3.858	17 − *j*117						20 − *j*272
3.9					130 + *j*450	12.5 + *j*20	21.5 − *j*179
4.0	18 − *j*100	27.6 − *j*145	24 − *j*125				23 − *j*100
7.0	150 + *j*154	105 + *j*135	122 + *j*161				
7.1				40 − *j*14.1			
7.15	160 + *j*162	114 + *j*150	129 + *j*178				
7.2					64 − *j*340		
7.25						13 + *j*25	18 + *j*339
7.3	172 + *j*168	128 + *j*169	147 + *j*194				
14.0	80 − *j*99.4	79 − *j*214	58 − *j*128				
14.1	81 − *j*87.5			500 + *j*0			
14.2	83 − *j*81.5	73 − *j*192	55 − *j*120				
14.25					137 + *j*16.5	18 + *j*39	26 + *j*63.5
14.3	82 − *j*77						
14.4		69 − *j*170	51.5 − *j*111				
21.0		485 − *j*94	204 − *j*218	57 − *j*78.5	} Use of these not recommended because of high-angle radiation.		
29.0		159 + *j*32	73 + *j*100				

[1] Radials not buried but grounded at ends and center.
[2] Measurements made with HiQ loading coil installed for each band.
[3] Measurements made with standard loading coils except for 40-meter band which was measured with 20-meter coil.
[4] Ground resistance high.
NOTE: All measurements are in ohms resistance followed by ohms reactance.

• Recent Equipment —

The National NC-300 Receiver

WHAT with the high-powered publicity campaign that preceded and accompanied the NC-300 receiver, this reviewer was prepared to pick it to pieces for the same reasons that he is usually critical of an oversold movie or book. It's a pleasure to report, therefore, that upon seeing the receiver we immediately forgot about being a prejudiced hypercritic, and an enjoyable few hours were spent getting acquainted with the instrument.

The styling of the receiver is different from any piece of communications gear we've seen. Dark panel strips that set off the dial, S meter and some controls appear at first glance to be made of plastic. They aren't. They're die-cast metal, with the company name in bas-relief and polished to give a lasting finish. The large-diameter weighted tuning dial turns easily and, like the old HRO dials, can be spun from one end of the band to the other, for quick excursions. The slide-rule tuning scale corresponding to the band flips into the window when the band switch is turned, so that there is never a moment's doubt as to what band you're on.

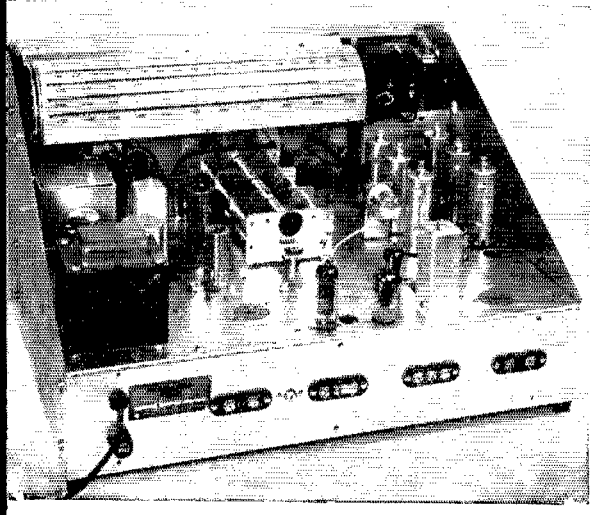
Maybe it would be better to start with an over-all picture of the receiver. It is a ham-band only receiver, just covering each of the bands from 160 through 10 meters. (The 11-meter range is 26.5 to 27.5 Mc.). In addition, the receiver tunes 30 to 35 Mc., so that 6-, 2- and 1¼-meter external converters can be used. Three directly-calibrated scales are furnished for these three bands, so that the use of suitable crystals in the converters will give direct-reading scales on "The World Above 50 Mc."

The NC-300 is a double conversion receiver. The tunable front end uses a 6BZ6 r.f. stage, 6BA7 first mixer and 6AH6 h.f. oscillator, as shown in the block diagram in Fig. 1. The first i.f. is 2215 kc., and a circuit departure is the use of a crystal filter between the 6BA7 first mixer and the 6BE6 second converter. We call it a departure because we're used to thinking of crystal filters at 455 kc., although some years back the National Company used one at 1600 kc. This 2215-kc. filter is conventional in that it has the usual selectivity switch for selecting the bandwidth and a phasing control for varying the position of the rejection notch.

The output of the 6BE6 second converter (self-controlled oscillator, not crystal) is at 80 kc. The 80-kc. i.f. is a two-stage affair using 6BJ6s, and it is here that the NC-300 gets three degrees of selectivity: nominal bandwidths of 0.5, 3.5 and 8 kc. These bandwidths are obtained by the use of six high-Q tuned circuits and coupling changes. The grids and plates of the 6BJ6s are switched simultaneously to various taps on the coils, to maintain substantially constant gain with changes in bandwidth. Except in the sharpest position this selectivity is used in conjunction with the peak and/or notch of the crystal filter, in much the same way as a Q multiplier or T-notch filter. Two second detectors are used, a diode for a.m. reception and a 6BE6 converter for heterodyne reception of c.w. or s.s.b. signals. The oscillator portion of the 6BE6 is, of course, the b.f.o.

Following the detectors and noise limiter, the audio amplification is handled by one section of a 12AT7 and a 6AQ5. A tone control in the audio section works in the usual manner to attenuate the high audio frequencies, except that in the extreme counterclockwise position it switches in a smaller coupling capacitor that attenuates the low frequencies and tends to equalize the roll-off characteristic introduced by the crystal filter. The extra half of the 12AT7 is used as an S-meter amplifier, deriving its signal from the diode detector load resistor.

The automatic noise limiter in the NC-300 works on a.m. reception only and a panel control allows the limiting level to be set to meet existing conditions. Noise limiting for c.w. or s.s.b. reception is obtained in the i.f. amplifier through the use of short time-constant grid circuits. This type



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Rear view of the NC-300. The large tuning scale can be seen above the tuning-capacitor gang — only the scale corresponding to the band in use can be seen through the panel window. The high-Q 80-kc. tuned circuit shield cans are at the right — the box at the left houses the 2215-kc. crystal filter. The small power transformer runs cold because the entire receiver has a low power demand.

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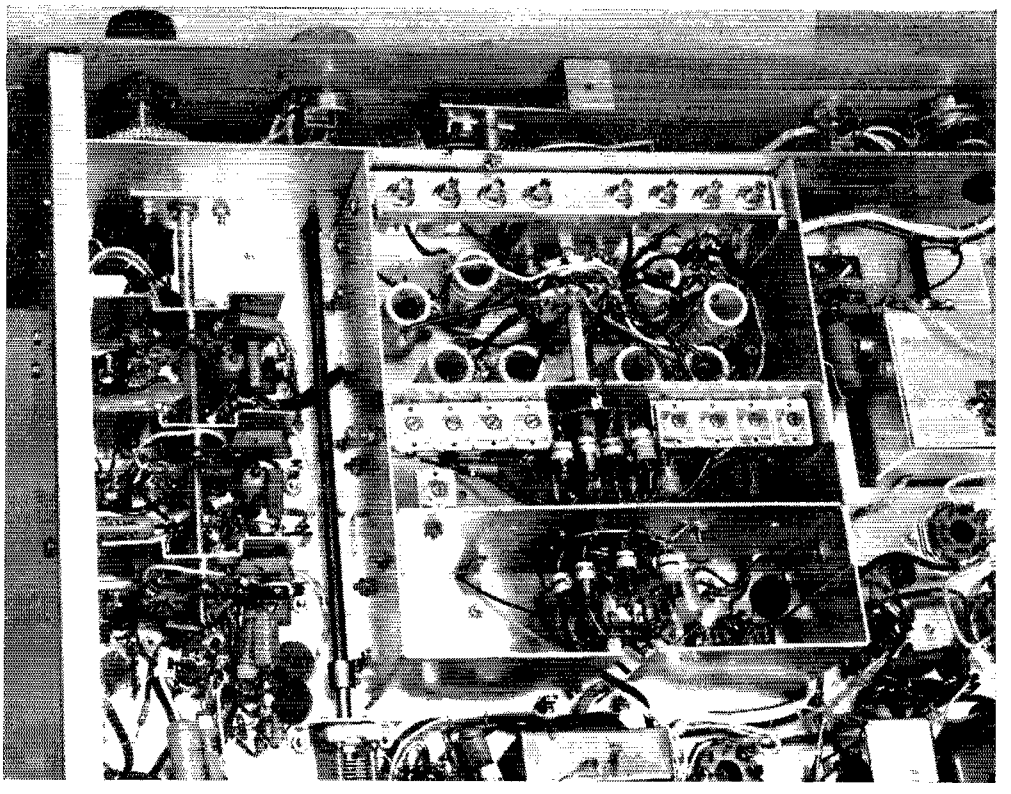

A close-up view of the NC-300 "front end." The oscillator coils are wound on ceramic forms and air trimmers are used for padding; the signal circuits use mica trimmers and phenolite or polystyrene forms.

of limiting is similar to that used in many f.m. receivers and requires proper use of the manual control for best results, since the gain must be run high enough to permit the noise peaks to be limited but not so high that the signal limits appreciably. And speaking of the manual gain control, the NC-300 offers a choice of gain-control characteristic through a switch on the audio volume control that switches the r.f. stage on or off the manual gain control circuit. Thus it is possible to run the r.f. stage wide open when QRM conditions permit it, to obtain best weak-signal reception. The a.v.c. voltage applied to the first r.f. stage is not the full voltage applied to the i.f. stages, another circuit stunt to maintain a good signal-to-noise ratio over the widest possible range.

The tuning rate of the dial is slower than most you will find in the current crop of receivers: to cover the bands it requires a minimum of 14 revolutions (14 Mc.) and a maximum of 16¼ revolutions (3.5 and 28 Mc.). This is quite useful when easing into a single-sideband signal and, because of the free-spinning feature, no hardship on anyone who likes to hop around the bands.

The band-selector switch and the "Mode" switch have bars instead of knobs, for easier turning and for ready spotting on the panel. The "Mode" switch is a four-position affair: it switches to the diode detector and AVC on "AM", on "SSB" it switches to the detector-BFO but leaves the AVC on, on "CW" it cuts out the AVC of the previous position, and on "ACC" (for "accessory") it switches the audio

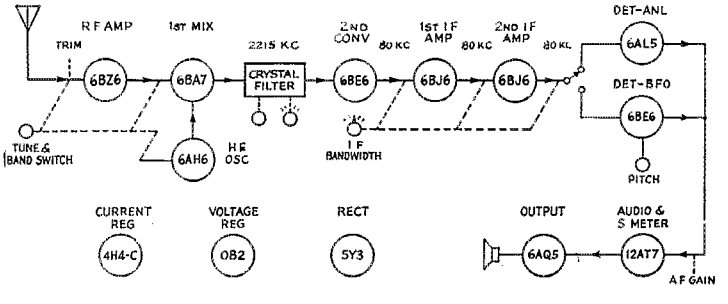

Fig. 1 — A block diagram of the NC-300 receiver. Manual gain and a.v.c. are applied to the r.f. amplifier and two i.f. amplifier stages. The 4H4-C current regulator stabilizes the heater current of the 6AH6 h.f. oscillator stage, and the OB2 stabilizes h.f. oscillator, 6BE6 2nd converter oscillator section, and the b.f.o.

amplifier to an accessory socket where you can introduce the signal from a record player. The position of the "Mode" switch is indicated through a small window adjacent to the switch bar.

The dial has a cute trick. Its pointer is moved by a dial cord driven from the capacitor shaft. To bring the pointer into exact calibration on the dial, a "Calibration Set" control on the panel moves some idler pulleys that change the location

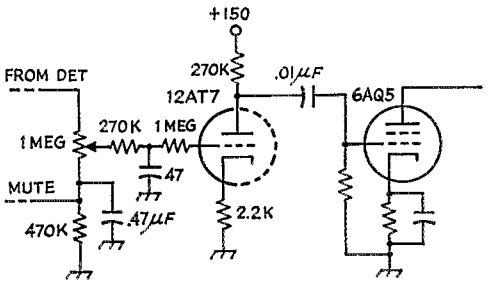

Fig. 2 — **Receiver muting is obtained by applying a transmitter-developed negative voltage to bias off the first audio stage. The muting voltage can be obtained from a grid leak in the transmitter.**

of the pointer without changing the capacitor setting. Consequently, all you have to do is to tune in the marker signal and adjust the Calibration Set control to bring the pointer into exact calibration at that point. No 100-kc. crystal calibrator is furnished with the NC-300, but a socket is provided for such a unit (the XCU-300), and it can be installed easily at any time. The adjustable pointer feature helps when you use v.h.f. converters, because your crystal doesn't have to be "on the nose."

We were assured by the manufacturer that every effort was made to build into the receiver as much stability as possible and, to this end, a higher C/L ratio is used in the high-frequency oscillator circuit than is used in the r.f. signal circuits. This is the first time we have seen this done in a commercial receiver. Another stunt that contributes to stability is the low power consumption — the highest plate voltage is 150, and the total receiver power drain is 60 watts.

External connections are provided for muting the receiver by applying negative voltage (22 to 50) derived from the transmitter. This can be the voltage developed across a grid leak. In the receiver, the muting voltage is applied to the control grid of the first audio stage, as shown in Fig. 2. It is also possible to control the muting by auxiliary contacts on an antenna relay. The receiver also has the usual provision for control of the transmitter power relay through the receiver's "Transmit-Receive" switch. An accessory socket is furnished where you can steal receiver power up to the limit of 1.5 amperes at 6.3 volts a.c. and 25 ma. at 150 volts d.c.

— *B. G.*

The HT-31 Linear Amplifier

You will look in vain for unusual circuit tricks or mechanical gimmicks in the new HT-31 r.f. power amplifier — it features straightforward engineering in both electrical and layout details, using well-established circuitry and components. Using a pair of 811As, the unit complete with power supply is in a 20 × 12¼ × 17¼-inch case. On single sideband, it is rated at 330 watts peak envelope power output. This is also approximately the c.w. power output, but since the efficiency can be somewhat higher in Class C operation, it should be possible to raise the figure slightly in code work. For linear amplification of an a.m. signal the output is of necessity limited by the plate-dissipation capabilities of the 811As, which means that when the operating conditions are adjusted for 100 per cent modulation the effective carrier output is about 65 watts.

The circuit diagram, reproduced from the instruction book, is shown in Fig. 1. The r.f. tubes are in parallel, have a pi-network plate tank designed for 50- to 600-ohm loads, and get their excitation through a balanced parallel-tuned grid

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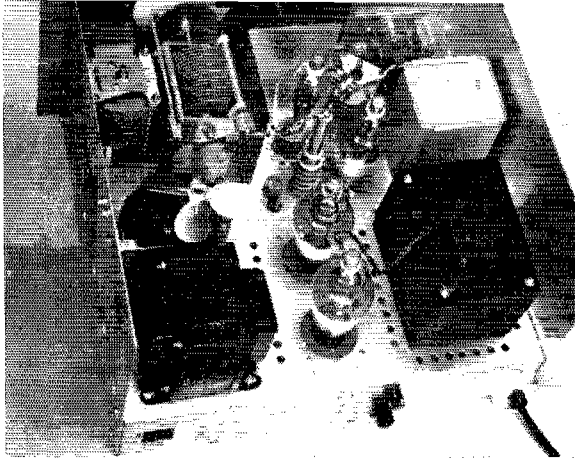
Although furnished in the cabinet shown for installation on the operating table, the HT-31 also can be rack mounted since the panel dimensions are standard (10¾ by 19 inches). The modern styling of the panel incorporates recessed and screened tuning dial and meter, for preventing TV harmonic radiation. Controls at the left are the grid-circuit bandswitch, meter switch, and grid tuning. Amplifier controls — plate tuning, fine and coarse loading — are at the right. A blank tuning chart is provided for recording actual control settings for the various bands.



The cover that shields the r.f. circuits has been removed in this photograph. The variable loading capacitor is at the upper left in this view. The plate tank capacitor, to its right, is ganged with the variable inductor just below. The grid turret and the neutralizing condenser are at the upper right. Power supply components are grouped on the near side of the chassis. Total power consumption is 750 watts.

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tank which also provides the necessary neutralizing voltage (grid neutralization). Turret-mounted coils are used for band switching in the grid circuit. In the plate tank, the roller-type variable inductor and the input capacitor are ganged together. The output capacitance consists of a 350-$\mu\mu$f. variable plus a succession of fixed units that may be paralleled across it to give a total of almost 3000 $\mu\mu$f. Space is available underneath the chassis for installing a low-pass filter, where necessary, to reduce harmonic output in the TV bands, and an opening on the rear chassis lip is provided for the filter output connector. The filter is available from Hallicrafters, manufacturer of the HT-31, as an accessory.

The high-voltage power supply furnishes 1500 volts for a maximum continuous plate input of slightly over 500 watts to the 811As. The filter is a single-section choke-input affair using a 10-μf. capacitor. The "free" bleeder system is used — i.e., there is no bleeder resistor, the bleed current being the no-signal plate current of the r.f. tubes. The rectifiers are 866As.

Grid and plate currents of the 811A amplifier are metered by means of the circuit arrangement shown in Fig. 1, a single meter being switched for the two readings.[1] The meter scale is also calibrated in watts input, corresponding to multiplying the plate-current calibration by 1500.

Over-all cooling is provided by the fan shown in the photographs, which pulls air through the cabinet from holes in the bottom.

For satisfactory operation as a single-sideband linear the driving power as specified in the instruction book varies from 8.5 watts at 3.5 Mc. to 20–25 watts in the 28-Mc. band. These are peak envelope powers corresponding to the c.w. driving power required for maximum rated output. The grid coils on 80, 40 and 20 meters are each loaded by a 22,000-ohm 2-watt resistor. Whether or not additional swamping will be required for s.s.b. operation depends on the regulation characteristics of the particular exciter used. The grid input circuit is designed for an impedance level of 50–75 ohms, so the exciter should be capable of delivering its output into a load of that order. — *G. G.*

[1] This circuit has the advantage that the meter is at ground potential for both plate-current and grid-current readings so long as the plate shunt (R105) is in good condition. Should this shunt open up this is no longer true, and high voltage may appear on the meter. In the HT-31 this is not a safety hazard since the meter is completely isolated from the panel and cannot be touched. Similar precautions should be taken if the circuit is applied to a home-built transmitter.

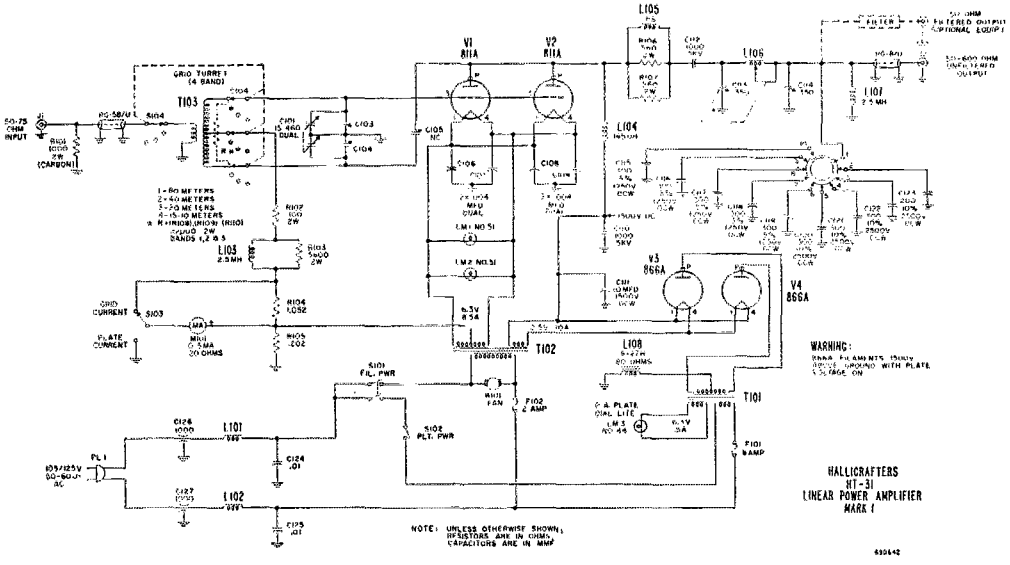


Fig. 1

A.R.R.L. AFFILIATED-CLUB CLASS INSTRUCTION

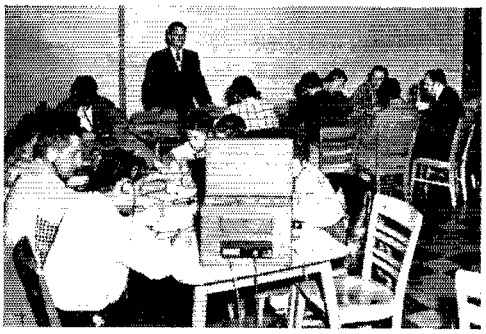
The following chart lists information as furnished by a number of ARRL-Affiliated Clubs. Further class details can be obtained by contacting the individual club through the address given in the "information" column.

State	*City*	*Affiliated Club*	*Information*	*Code*	*Theory*
Calif.	Burbank	Lockheed Amateur Radio Club	S. E. Campbell, 4432 Union Ave., La Canada	X	X
	La Crescenta	Crescenta Valley Radio Club	D. Thatcher, 3427 Altura Ave.	X	
	Los Angeles	Frank Wiggins Amateur Radio Club	David Wersen, Room 500, 1646 So. Olive St.	X	X
	Mt. View	Mountain View Amateur Radio Club	F. R. Nickle, 250 E. Edith Ave., Los Altos		X
	Red Bluff	Tehama County Amateur Radio Club	G. R. Hobbs, Box 352	X	X
Conn.	Hamden	Hamden Amateur Radio Assn., Inc.	R. Warren, 99 Amory St., New Haven	X	X
	Manchester	Manchester Radio Club	R. Reichenbach, 41 Center	X	X
D. C.	Washington	Andrews Electronics Assn.	M. Sgt. W. K. Thomas, Hq. AACS (D/Mat.), Andrews AFB	X	
	Washington	Washington Radio Club	E. C. Van Deusen, 3711 McKinley St., NW	X	X
Florida	Eglin AFB	Eglin Amateur Radio Society	F. M. Butler, Jr., 28 So. Elliot Rd., Ft. Walton Beach	X	
	Ft. Lauderdale	Broward Amateur Radio Club	Noble Smith, 1639 Funston, Hollywood	X	
	Lakeland	Lakeland Amateur Radio Society	Lorene T. Early, Box 249, Nichols	X	X
	Leesburg	Lake Amateur Radio Assn., Inc.	R. A. Hollenbeck, 713 Orange Ave., Eustis	X	X
	St. Petersburg	St. Petersburg Amateur Radio Club	Ward Curley, Box 666, Pinellas Park	X	X
Georgia	Atlanta	Atlanta Radio Club	T. M. Moss, Box 644, Municipal Airport Branch	X	X
Ill.	Bloomington	Central Illinois Radio Club	A. E. Wolff, 1407 W. Grove St.	X	X
	Downers Grove	DuPage Radio Club	E. E. Potenza, 63rd & Grand Ave.	X	X
	Joliet	Joliet Amateur Radio Society	G. S. Bones, 2320 N. Raynor	X	X
	Springfield	Sangaman Valley Radio Club	E. A. Metzger, 1520 So. 4th	X	
Ind.	Frankfort	North Central Indiana Amateur Radio Club	D. Massey, 1552 E. Wabash	X	X
Iowa	Burlington	Iowa-Illinois Amateur Radio Club	R. F. Uffelman, 1907 Lucas	X	X
	Iowa City	QSO & QRM Society of Iowa	Bill Bywater, Box 471	X	X
Kans.	El Dorado	El Dorado Amateur Radio Club	Jerry Borger, 421 N. Emporia	X	X
	Salina	Central Kansas Radio Club	J. W. Addison, 908 So. 11th	X	X
La.	New Orleans	Greater New Orleans Amateur Radio Club	Randy Randall, Box 13003	X	X
Maine	Portland	Portland Amateur Wireless Assn.	A. M. Harmon, 97 State St.	X	X
Mass.	Lawrence	Merrimack Valley Amateur Radio Club	Stephen Dyer Jr., Box 211	X	X
	Southbridge	Quinebaug Valley Radio Club	R. J. LaReau, 159 Hamilton	X	X
	Waltham	El-Ray Amateur Radio Club	c/o Sec'y., El-Ray ARC, Raytheon Mfg. Co.	X	X
	Waltham	Middlesex Amateur Radio Club	W. G. Welsh, 1228 Cambridge, Cambridge	X	X
Mich.	Birmingham	Catalpa Amateur Radio Society	H. P. Estes, 4010 Beach Rd.	X	X
	Hastings	Barry Amateur Radio Assn.	C. B. Lightcap, Rt. 5	X	X
	Iron Mountain	Iron Mountain Amateur Radio Club	C. G. Steinke, 517 Stephenson Ave.	X	X
	Jackson	Jackson Amateur Radio Assn.	G. D. Kerr, 2449 W. Kimmel Rd.	X	X
Minn.	Minneapolis	Minneapolis Radio Club	E. M. Nordenfoss, 2924 Alabama Ave.	X	X
Mo.	St. Louis	St. Louis University Amateur Radio Club	Paul Steiner, 3621 W. Pine	X	X
Nebr.	Crete	Crete Amateur Radio Club	John Jacobs, Box 68, 538 Hawthorne	X	X
N. J.	Bloomfield	Bloomfield Radio Club	A. E. Sonn, 82 Broad St.	X	
	Morristown	Morris Radio Club, Inc.	Miss Dina Depetro, Parsippany Rd., Whippany	X	X
	Trenton	Hamilton Township Radio Assn.	C. T. Tart, 1051 Lalor	X	X
N. Y.	Albany	Albany Amateur Radio Assn.	J. A. Naughton Jr., 306 Northern Blvd.	X	X
	Clayton	Clayton Radio Club	S. J. Hammersley	X	X
	Mt. Kisco	Harmonic Hill Radio League	Geo. Magnuson, Box 655	X	X
	Nassau County	Northern Nassau Amateur Radio Club	C. Storch, 5 Winfield Terrace, Great Neck	X	X
	New York	Fordham Radio Club	Harold Sand, 2082 Crotona Parkway	X	X
	New York	Knickerbock Amateur Radio Club	Clay Cool, 163 W. 13 St.	X	X
Ohio	Akron	Buckeye Shortwave Radio Assn.	R. M. Darst, 2560 Thurmont Rd.	X	X
	Cincinnati	Greater Cincinnati Amateur Radio Assn.	Paul Wolf, 2005 Dana Ave.	X	X
	Cleveland	Westpark Radiops	James B. Bamberg, 680 Moore Rd., Avon Lake	X	X
	Painesville	Lake Geauga Amateur Radio Club	H. G. Warren, 145 Linden	X	X
	Springfield	Springfield Amateur Radio Club	W. O. Bayliss, 1613 Cypress	X	X
	Van Wert	Van Wert Amateur Radio Club	Oscar Tinker, 601 Hill-Crest	X	X
Penna.	Lancaster	Lancaster Radio Transmitting Society	A. C. Jacoby, 589 N. Plum	X	X
	Perkasie	North Penn Radio Amateur Club	W. O. Kulp, Ridge Rd., RD 1	X	X
	Philadelphia	University of Pennsylvania Amateur Radio Club	J. C. Balan, 200 South 33rd St.	X	X
	Waynesburg	Waynesburg College Radio Club	Waynesburg, Penna.	X	X
R. I.	Cranston	Cranston Radio Assn.	Nicholas Abbenante, 66 Victory St.	X	X
S. C.	Rock Hill	Rock Hill Amateur Radio Club	N. C. Tilley, 138½ Oakland	X	X
Tenn.	Cookeville	Tenn. Tech. Radio Club	J. V. King, Box 685, TPI, Cookeville	X	
	Oak Ridge	Oak Ridge Radio Operators' Club, Inc.	K. S. Warren, Box 291	X	X
Texas	Dallas	Dallas Amateur Radio Club	W. F. Waters, 1519 Kinghighway	X	X
	Edinburg	Rio Grande Valley Amateur Radio Club	Winfield Proctor, Box 330	X	
	El Paso	The El Paso Amateur Radio Club	E. G. Williams, 1501 Golden Hill Terrace	X	X
	Orange	Orange Amateur Radio Club	Carolyn Daly, 908 Front	X	X
Vermont	Burlington	Burlington Amateur Radio Club	B. W. Dean, Box 81	X	X
Va.	Newport News	Peninsula Amateur Radio Club	Tommy Lawford, 207 River Rd., Warwick	X	X
	Winchester	Shenandoah Valley Amateur Radio Club, Inc.	R. S. Wine, Box 139	X	X
Wash.	Puyallup	Valley Amateur Radio Club	L. E. Anderson, Box 12	X	X
	Seattle	West Seattle Radio Club	Toddy Nye, 6031 38th SW	X	X
	Vancouver	Clark County Amateur Radio Club	P. C. Shefchek, 5507 N.E. Buena Vista Rd.	X	
	Walla Walla	Walla Walla Valley Radio Amateur Club, Inc.	Murray Fisher, Box 941	X	X
Wisc.	Stevens Point	Point Radio Amateurs	F. L. Guth, 428 Ellis	X	X
T. H.	Hilo	Hilo Amateur Radio Club	Haruwo Yamamoto, Box 1659	X	X
Alta.	Lethbridge	Southern Alberta Amateur Radio Club	Murray Strome, 417 14 St.	X	X
Ont.	Hamilton	Hamilton Amateur Radio Club	K. Russell, 60 Wellington Ave., Burlington, Ont.	X	

The Helping Hand

A Review of Successful Training Programs

• Hams have long extended a helping hand to newcomers on an individual basis. With the advent of the Novice and Technician Class licenses, more and more clubs and radio firms began offering formal courses in amateur radio, tailored to the beginner. This is a report and idea exchange from just a few of the many such groups who have faced this challenging project and met with success. It may be the project you've been looking for.



Code classes at Allied Radio Corp. copy from the machine under the supervision of instructor W9MIK.

Dayton Amateur Radio Association (Ohio): The DARA courses are offered without charge, simple costs being borne by the club. Classes are held in the civil service examination room of the Dayton Municipal Building. We believe this helps hold attendance, since the location is easily accessible by public transportation and car. We have 2½-hour weekly instruction periods, for 9 weeks, with a code session broken by a talk and/or demonstration. The hours are so chosen that it is possible for the younger applicants to reach their homes from the schoolroom at a time thought to be "not too late" by even the stricter parents. Code is presented on tapes prepared and recorded by the committee. Weekly talks follow this pattern: *1st*, introduction to the code, how formed, and simple code-practice devices; *2nd*, symbols and Ohm's law; *3rd*, simple vacuum-tube theory and Ohm's law; *4th*, basic power supply, blackboard and demonstration with components breadboard style; *5th*, crystal oscillator, blackboard; *6th*, crystal oscillator, demonstration with power supply of 4th week and breadboard construction unit; *7th*, power amplifier, demonstration, breadboard, with previous units; *8th*, antennas, with particular emphasis on efficient radiators for the Novice bands; *9th*, general discussion of *ARRL License Manual* questions. Each week time is allowed for a question-and-answer period, but should a barrage of queries threaten to disrupt the schedule, we simply ask the questioners to stick around "after school," and generally this works out quite well. Results? Well, the average registration for each series for the past five years has been over the 100 mark, with an average mortality of 20 per cent. Of the number left, more than 75 per cent acquire the Novice license and over-all observation leads us to believe that more than half of this group goes on to acquire General Class. Naturally, DARA membership continues to show a healthy growth. The success of this plan is largely due to the yeoman work of W8ZOF, who put in a lot of thought, hours and work in preparing the tapes and program.

To summarize briefly, this is a guided "self-help" deal pointing to the Novice license. The response is widespread, with our cards showing an age spread of 9–64, with most in the range 12–50. Sessions are informal, but controlled with the plan in the hands of a committee. — *W8OVG*

Allied Radio Corporation (Chicago): The code class was originally sponsored by the Chicago Chapter of the Quarter Century Wireless Association. We obtained the aid of Allied and Hallicrafters in getting together the necessary components for setting up the class. Originally, classes were held at the Hallicrafters' plant on the west side of the city. In the beginning, a total of 120 enrolled in the class and meetings were held on Monday and Tuesday evenings. After a time, enrolment grew and the Hallicrafters' plant became inconvenient, so Allied Radio offered the facilities which were more convenient for all to reach. As a result of the newspaper advertising, and by word of mouth, the class grew to somewhat over 150 enrollees. Since we just couldn't care for the students properly with such large numbers on hand, we decided to divide the classes into two separate groups meeting on Monday and Thursday evenings. In teaching we made use of surplus TG-3 keyers. All of the necessary basic theory was covered that would be required for the Novice license examination. Reference was made to various books and publications that would be of use to the trainees. The majority of this group were men. There were perhaps 20 youngsters and about 8 or 10 women. Of this group, 81 passed their Novice examinations. The instructors in the QCWA sponsored class were W9CYD, W9MIK and myself, W9EVA. The new class, run by Allied Radio alone, began in mid-September. — *W9EVA*

(Continued on page 88)

CQ NR—Fifth Call for Annual Novice Round-up

February 4th Through February 19th

ROUND-UP PERIOD

Starts	*Ends*
Feb. 4th	Feb. 19th
6:00 P.M.	9:00 P.M.
Local Time	Local Time

ONCE again the familiar sound of CQ NR will present itself in the fifth annual Novice Round-up Contest. Whether or not you are a Novice, you are cordially extended the invitation to participate in what it is believed will be the biggest and most successful Novice Round-up since its beginning in 1952.

Novices in all parts of the United States and its Possessions may contact any amateur radio station and claim credit provided all necessary information is exchanged. All participating non-Novices will make Novice contacts *only*, giving the Novice the QSO number and section. Even though you may not be actively engaged in the contest, a few moments of your time will help the Novice secure those much sought after points.

The maximum operating time available will be a total of forty (40) hours, during the period which begins and ends on dates and times listed in the box above. All operating, listening and logging is included within this period.

A final score is computed by adding the total number of QSOs to the Code-Proficiency Award. The sum of these two is then multiplied by the number of *different* ARRL sections (see page 6) worked during the contest for a final score. By the way, for those *without* a Code-Proficiency Endorsement sticker it would be advisable to check *QST* listings for the dates of Code-Proficiency Runs (see contest rule 4), as these extra points will come in handy. Not only is this true, but you will also derive a feeling of self-satisfaction knowing you are that much closer to becoming an A-1 operator.

There are no known "hot spot" frequencies for operating this contest, but non-Novices would do well to check the frequencies just above and below the 3700–3750 kc., 7150–7200 kc., 21,100–21,250 kc., 145–147 Mc. frequency segments. The high-power boys will probably stick to the old custom of calling outside the Novice bands. This should reduce unnecessary QRM so that lower-powered Novices will have as little trouble as possible pulling QSOs from down under.

How to Participate

Let us suppose WN1GTL in the Connecticut section calls CQ NR and is answered by KN6HRA in the East Bay section. A correctly negotiated contact will look like this:

CQ NR CQ NR CQ NR DE WN1GTL WN1GTL WN1GTL K

WN1GTL WN1GTL WN1GTL DE KN6HRA KN6HRA KN6HRA AR

KN6HRA DE WN1GTL R HR NR 5 CONN BK

WN1GTL DE KN6HRA R HR NR 4 EBAY BK

KN6HRA DE WN1GTL R TNX ES 73 SK KN6HRA DE WN1GTL

Short? yes, but one need not "hit-and-run." If a rag-chew is desired by all means have one. Getting acquainted with your fellow hams is by no means taboo, it is one of the basic purposes for *all* contests. A good solid rag-chew is not only recommended, but is also good practice, so don't be afraid to "stay awhile," it won't hurt a bit.

ARRL has convenient Novice Round-up log forms to help minimize paper work and alleviate any possible mistakes. These forms are available without charge from the Communications Department. So OMs, CU in the NR!

(*Continued on page 146*)

Sample log form that must be used by all contestants.

STATION WN1GTL — SUMMARY OF CONTACTS
NOVICE ROUND-UP

Band	*Time on or off air*	*Date, Time of Contact*	*My NR Sent*	*My Section*	*His NR Rcvd*	*His Call*	*His Section*	*Number of each new Section as worked*
80	1801	Feb. 4						
		1807	1	Conn.	1	KN2MTA	N.L.I.	1
		1820	2	"	1	WN1FYU	Conn.	2
	1902	1850	3	"	2	W1ZDP	Conn.	—
40	1915	1920	4	"	10	KN2MSO	N.L.I.	—
		1930	5	"	4	KN6HRA	E. Bay	3
	2020	2005	6	"	5	W1ZID	Conn.	—
15	1200	Feb. 5						
		1215	7	"	7	KN0ASC	Iowa	4
		1232	8	"	5	KN9AKE	Ind.	5
		1240	9	"	9	W7SUJ	Ariz.	6
		1258	10	"	6	WN1GBZ	Conn.	—
	1325	1312	11	"	16	W1AW	Conn.	—

Total operating time: 3 hours 31 min. *No. contacts:* 11
Bands used: 80, 40 and 15 *CP credit:* 10
No. sections: 6

Claimed score: 11 contacts plus 10 CP = 21 × 6 (sections) = 126

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is true and correct to the best of my knowledge.

Signature:.....
Address:.....

22nd ARRL International DX Competition

Phone: Feb. 10th–12th and Mar. 9th–11th; C.W.: Feb. 24th–26th and Mar. 23rd–25th

AMATEURS all over the world are cordially invited to take part in the 22nd ARRL International DX Competition, to be held four week ends in February and March. U. S. and Canadian operators will be trying to add to their DX country totals, other stations to work needed states and provinces for their WAS and WAVE awards, and everyone to match operating skill with others in his country or ARRL section.

Two week ends are devoted to c.w. and two to phone operation, giving everyone a chance to participate on both modes. "Rest up" periods are provided between week ends.

As in the past, certificate awards are offered to the top single-operator phone and c.w. scorer in each country and ARRL section. A special category recognizes multiple-operator stations in those sections or countries from which three or more valid multiple-operator entries are received. Within a club, single-operator entries can compete for the club certificate awards given to the highest c.w. and phone scorers. A handsome gavel is also offered to the club whose members run up the highest aggregate score.

The rules of the contest are exactly the same as those of last year. Stations outside W (K) and VE/VO will call "CQ W/VE" and attempt to trade contest exchanges with U. S. and Canadian participants. Those overseas will transmit 5- or 6-digit numbers, the first numbers indicating the signal report and the last three the power input. Stations with 500 watts input would use a power number of 500; those with 25 watts, 025. *Example:* CR6AI, running 100 watts input, might send "569100" on c.w., "56100" on phone.

U. S. and Canadian amateurs will transmit an RS or RST report plus their state or province, or some abbreviation for the state or province.

EXPLANATION OF DX CONTEST EXCHANGES

Stations in U. S. and Canada Send:

	RS or RST Report of Station Worked	*Your State or Province (or Abbreviation)*
Sample (c.w.)	579	VT
Sample (phone)	57	Vermont

Stations Outside U. S. and Canada Send:

	RS or RST Report of Station Worked	*Three-Digit Number Representing Your Power Input*
Sample (c.w.)	579	075
Sample (phone)	57	500

CONTEST TIMETABLE

Phone Section:

Time	*Starts*		*Ends*	
GMT	Feb. 10th	2400	Feb. 12th	2400
AST	Feb. 10th	8:00 P.M.	Feb. 12th	8:00 P.M.
EST	Feb. 10th	7:00 P.M.	Feb. 12th	7:00 P.M.
CST	Feb. 10th	6:00 P.M.	Feb. 12th	6:00 P.M.
MST	Feb. 10th	5:00 P.M.	Feb. 12th	5:00 P.M.
PST	Feb. 10th	4:00 P.M.	Feb. 12th	4:00 P.M.
The second period of this contest starts at these same hours Mar. 9th.			The second period of this contest ends at these same hours Mar. 11th.	

C.W. Section:

GMT	Feb. 24th	2400	Feb. 26th	2400
AST	Feb. 24th	8:00 P.M.	Feb. 26th	8:00 P.M.
EST	Feb. 24th	7:00 P.M.	Feb. 26th	7:00 P.M.
CST	Feb. 24th	6:00 P.M.	Feb. 26th	6:00 P.M.
MST	Feb. 24th	5:00 P.M.	Feb. 26th	5:00 P.M.
PST	Feb. 24th	4:00 P.M.	Feb. 26th	4:00 P.M.
The second period of this contest starts at these same hours Mar. 23rd.			The second period of this contest ends at these same hours Mar. 25th.	

Example: W4KWY in Virginia might send "579VA" on c.w., or say "57 Virginia" on phone. *Note that W (K) and VE/VO entrants do not indicate power inputs.*

For purposes of conformity, it is suggested that W/VE c.w. amateurs use this tabulation to indicate states or provinces. Overseas operators may use it as a check-off list of states and provinces worked, and for logging abbreviations.

W1 — CONN MAINE MASS NH RI VT
W2 — NJ NY
W3 — DEL MD PA DC
W4 — ALA FLA GA KY NC SC TENN VA
W5 — ARK LA MISS NMEX OKLA TEXAS
W6 — CAL
W7 — ARIZ IDAHO MONT NEV ORE UTAH WASH WYO
W8 — MICH OHIO WVA
W9 — ILL IND WIS
W0 — COLO IOWA KANS MINN MO NEBR NDAK SDAK
VE1 — NB NS PEI
VE2 — QUE
VE3 — ONT
VE4 — MAN
VE5 — SASK
VE6 — ALTA
VE7 — BC
VE8 — NWT YUKON
VO — NFLD LAB

You can try a "CQ TEST" if you're in U. S. or Canada, although past experience shows that the *rare* DX will seldom reply. W/VE amateurs have quotas on c.w. (see rule 10) but none on phone. DX amateurs have no quotas; they will QSO as many stations in the 19 W (K) and VE/

LOG, 22nd INTERNATIONAL DX COMPETITION

Call..... *ARRL SECTION*.....
Band.....*Mc.* *Sheet*.....*of*.....

Country	*Station Worked*	*Date*	*Time (GMT)*	*Sent*	*Received*
France	F8VJ	2/25	1300	589CONN	479075
	F9MS	2/25	1345	569CONN	579080
England	G2BB	2/25	1306	589CONN	469150
	G4CP	2/26	1245	579CONN	469125
	G2QT	2/26	1255	569CONN	579100
	G3HJJ	3/24	1430	469CONN	559100
	G6ZO	3/25	1822	579CONN	589125
	G5RI	3/25	1851	469CONN	459075
Germany	DL1KB	2/25	1315	559CONN	449050
	DL1DX	2/26	1149	469CONN	559080
	DL1BR	3/24	1502	559CONN	559045

Sample of report form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed, the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

«

VO licensing areas as possible on each band.

Keep your log carefully and send a copy of it, in the form shown, to ARRL as soon as the contest ends. All reports, large and small, are welcome. Convenient contest forms are now available free upon request from the ARRL Communications Department, 38 La Salle Road, West Hartford, Conn.

Get your station functioning at peak efficiency and read over the rules to acquaint yourself with the pattern. Whether you run 5, 50 or 500 watts input . . . whether you use multielement beams or a wire out the window . . . there will be fun for you in the 22nd International DX Competition!

Rules

1) *Eligibility:* Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.

2) *Object:* Amateurs in the continental U. S. and Canada will try to work as many amateur stations in other parts of

Sample of report form that must be used by W/VE phone entrants and *all* participants outside U. S. and Canada, phone and c.w. This example is a U. S. A. phone log. Foreign competitors, of course, would have reverse information in the "Sent" and "Received" columns; their "Received" column would show exchanges like "579CAL," "589ONT" (or, on phone, "46 Vermont," "58 Georgia," etc.), indicating signal reports received and different states and provinces worked; their "Sent" column would carry signal reports and power indicators transmitted.

LOG, 22nd A.R.R.L. INTERNATIONAL DX COMPETITION

Sheet.....*of*..... *Call*..... *ARRL Section*.....*or Country*.....

Date & Time GMT	*Station Worked*	*Country*	*Record of New Countries for Each Band*							*Exchange*		*Points*
			1.8	*3.5*	*7*	*14*	*21*	*27*	*28*	*Sent*	*Received*	
Feb. 11												
0005	HR1FM	Honduras				1				56 Maine	57080	3
Feb. 12												
1300	PAØULA	Netherlands							1	58 Maine	47075	3
1306	G3COJ	England							2	58 Maine	46150	3
1345	PAØVB	Netherlands							2	56 Maine	59080	3
2030	LU1DDV	Argentina							3	58 Maine	57750	3
2310	VP9X	Bermuda				2				57 Maine	56050	3
Mar. 10												
1020	ZL1MB	New Zealand				3				58 Maine	58075	3
1035	VK5XN	Australia		1						47 Maine	46100	3
1105	VK2RA	Australia		1						46 Maine	45100	3
1421	PAØXD	Netherlands							3	45 Maine	57100	3
Mar. 11												
0925	EI9A	Ireland				4			3	57 Maine	57050	3
1245	G2PU	England									46125	2
1255	G3DO	England							3	56 Maine	57100	3
1350	G2PU	England							3	57 Maine		1
1430	G5BA	England							3	46 Maine	55100	3
2320	KZ5DG	Canal Zone				5				58 Maine	58500	3

SUMMARY, 22nd A.R.R.L. INTERNATIONAL DX COMPETITION

.....*Entry Call*.....*ARRL Section*.....*or Country*.....
(*C.W. or Phone*)

Name.....*Address*.....

Transmitter Tubes.....*Power Input*.....

Receiver.....*Antenna(s)*.....

(Logs from W(K) and VE/VO show *number of foreign countries* worked. Logs from other countries show *number of U. S. A. and Canadian call areas* worked.)

Bands	*1.8 Mc.*	*3.5 Mc.*	*7 Mc.*	*14 Mc.*	*21 Mc.*	*27 Mc.*	*28 Mc.*	*Total*
No. Countries QSOd		1		5			*3*	**9*
No. of Contacts		2		5			3	*15*

Number of Different Countries Worked.....*Number of Hours of Station Operation*.....

Assisting Person(s): Name(s) or Call(s)

46 (*Points*) × *9* (*Multiplier*) = *405* FINAL SCORE

Participation for Club Award in the.....
(*Name of Club*)

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the ARRL Award Committee.

.....
Operator's Signature

* Figure in this box is multiplier.

Sample of summary sheet that must accompany all reports.

the world as possible under the rules and during the contest periods.

3) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

4) *Entry Classifications:* Entry may be made in either or both the phone or c.w. sections: c.w. scores are independent of phone scores. Entries will be further classified as single- or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keeping the station log and records.

5) *Contest Periods:* There are four week ends, each 48 hours long: two for phone work and two for c.w. The phone section starts at 2400 GMT, Friday, February 10th and Friday, March 9th, ends 2400 GMT, Sunday, February 12th and Sunday, March 11th. The c.w. section starts at 2400 GMT, Friday, February 24th and Friday, March 23rd, ends 2400 GMT, Sunday, February 26th and Sunday, March 25th.

6) *Valid Contacts:* In the phone section, all claimed credits must be made voice-to-voice. In the telegraph section, only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) *Exchanges:*

a) *Amateurs in U. S. and Canada* will transmit a three-figure number, representing the RST report, plus their state or province. (The latter may consist of an appropriate abbreviation.) Phone participants will transmit a two-figure number consisting of the readability-strength report plus the state or province. *Example:* W6YY might transmit "579CAL" on c.w., "57 California" on phone.

b) *Amateurs outside W (K) and VE/VO* will transmit six-figure numbers, each consisting of the RST report plus three "power" numbers; the power indicator will represent the approximate transmitter power input. Phone contestants will transmit five-figure numbers, each consisting of a readability-strength report and the three "power" numbers. *Example:* VK2GW, with 100 watts input, might transmit "569100" on c.w., "56100" on phone. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) *Scoring:*

a) *Points:* One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a contest exchange sent, and two points upon acknowledging an exchange received. Two points are earned by any other station upon receiving acknowledgment of a contest exchange sent, and one point upon acknowledging an exchange received.

b) *Final Score:* W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus the number of W (K) and VE/VO licensing areas worked on each other band.

Countries will be those on the ARRL Countries List. There are 19 licensing areas: 10 in the United States, 9 in Canada (VO, VE1–VE8). [See Countries List on p. 54 and Footnote 1 on p. 140 — Ed.]

9) *Repeat Contacts:* The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10) *Quotas:* The maximum number of points per country

(*Continued on page 138*)

A.R.R.L. COUNTRIES LIST • *Official List for ARRL DX Contest and the Postwar DXCC*

AC3 ..... Sikkim
AC4 ..... Tibet
AP ..... Pakistan
BV, (C3) ..... Formosa
C (unofficial) ..... China
C3 ..... (See BV)
C9 ..... Manchuria
CE ..... Chile
CE7Z-, LU-Z, VK1, VP8 .. Antarctica
CEØ ..... Easter Island
CM, CO ..... Cuba
CN2, KT1 ..... Tangier Zone
CN8 ..... French Morocco
CP ..... Bolivia
CR4 ..... Cape Verde Islands
CR5 ..... Portuguese Guinea
CR5 ..... Principe, Sao Thome
CR6 ..... Angola
CR7 ..... Mozambique
CR8 ..... Goa (Portuguese India)
CR9 ..... Macau
CR10 ..... Portuguese Timor
CT1 ..... Portugal
CT2, CS3 ..... Azores Islands
CT3 ..... Madeira Islands
CX ..... Uruguay
DJ, DL, DM ..... Germany
DU ..... Philippine Islands
EA ..... Spain
EA6 ..... Balearic Islands
EA8 ..... Canary Islands
EA9 ..... Ifni
EA9 ..... Rio de Oro
EA9 ..... Spanish Morocco
EAØ ..... Spanish Guinea
EI ..... Republic of Ireland
EL ..... Liberia
EQ ..... Iran (Persia)
ET2 ..... Eritrea
ET3 ..... Ethiopia
F ..... France
FA ..... Algeria
FB8 .. Amsterdam & St. Paul Islands
FB8 ..... Kerguelen Islands
FB8 ..... Madagascar
FC ..... Corsica
FD ..... French Togoland
FE8 ..... French Cameroons
FF8 ..... French West Africa
FG ..... Guadeloupe
FG ..... Saint Martin
FI8 ..... French Indo-China
FI8 ..... Viet Nam
FK8 ..... New Caledonia
FL8 ..... French Somaliland
FM ..... Martinique
FN ..... French India
FO8 ..... Clipperton Island
FO8 .... French Oceania (e.g., Tahiti)
FP8 .. St. Pierre & Miquelon Islands
FQ8 ..... French Equatorial Africa
FR7 ..... Reunion Island
FU8, YJ ..... New Hebrides
FW8 ..... Wallis & Futuna Islands
FY7 ..... French Guiana & Inini
G ..... England
GC ..... Channel Islands
GD ..... Isle of Man
GI ..... Northern Ireland
GM ..... Scotland
GW ..... Wales
HA ..... Hungary
HB1, 9 ..... Switzerland
HC ..... Ecuador
HC8 ..... Galapagos Islands
HE ..... Leichtenstein
HH ..... Haiti
HI ..... Dominican Republic
HK ..... Colombia
HKØ ..... Archipelago of San Andres and Providencia
HL ..... Korea
HP ..... Panama
HR ..... Honduras
HS ..... Siam
HV ..... Vatican City
HZ .. Saudi Arabia (Hedjaz & Nejd)
I1 ..... Italy
I1 ..... Trieste
I5, MS4 ..... Italian Somaliland
IS1 ..... Sardinia
JA, KA ..... Japan
JY, ZC7 ..... Jordan
JZØ ..... Netherlands New Guinea
K, W ..... United States of America
KA ..... (See JA)
KAØ ..... Bonin & Volcano Islands
KB6 .. Baker, Howland & American Phoenix Islands
KC4 ..... Navassa Island
KC6 ..... Eastern Caroline Islands
KC6 ..... Western Caroline Islands
KG1 ..... (See OX)
KG4 ..... Guantanamo Bay
KG6 ..... Mariana Islands
KH6 ..... Hawaiian Islands
KJ6 ..... Johnston Island
KL7 ..... Alaska
KM6 ..... Midway Islands
KP4 ..... Puerto Rico
KP6 .. Palmyra Group, Jarvis Island
KR6 .. Ryukyu Islands (e.g., Okinawa)
KS4 ..... Swan Island
KS6 ..... American Samoa
KT1 ..... (See CN2)
KV4 ..... Virgin Islands
KW6 ..... Wake Island
KX6 ..... Marshall Islands
KZ5 ..... Canal Zone
LA, LB ..... Jan Mayen
LA, LB ..... Norway
LA, LB ..... Svalbard (Spitzbergen)
LU ..... Argentina
LU-Z ..... (See CE7Z-, VP8)
LX ..... Luxembourg
LZ ..... Bulgaria
M1 ..... San Marino
MP4 ..... Bahrein Island
MP4 ..... Kuwait
MP4 ..... Qatar
MP4 ..... Trucial Oman
MS4 ..... (See I5)
OA ..... Peru
OD5 ..... Lebanon
OE ..... Austria
OH ..... Finland
OK ..... Czechoslovakia
ON4 ..... Belgium
OQ5, Ø ..... Belgian Congo
OX, KG1 ..... Greenland
OY ..... Faeroes
OZ ..... Denmark
PAØ ..... Netherlands
PJ2 ..... Netherlands West Indies
PJ2M ..... Sint Maarten
PK1, 2, 3 ..... Java
PK4 ..... Sumatra
PK5 ..... Netherlands Borneo
PK6 .... Celebes & Molucca Islands
PX ..... Andorra
PY ..... Brazil
PZ1 ..... Netherlands Guiana
SM ..... Sweden
SP ..... Poland
ST ..... Anglo-Egyptian Sudan
SU ..... Egypt
SV ..... Greece
SV ..... Crete
SV ..... Dodecanese (e.g., Rhodes)
TA ..... Turkey
TF ..... Iceland
TG ..... Guatemala
TI ..... Costa Rica
TI9 ..... Cocos Island
UA1, 3, 4, 6 ..... European Russian Socialist Federated Soviet Republic
UA9, Ø ..... Asiatic Russian S.F.S.R.
UB5 ..... Ukraine
UC2 ..... White Russian Soviet Socialist Republic
UD6 ..... Azerbaijan
UF6 ..... Georgia
UG6 ..... Armenia
UH8 ..... Turkoman
UI8 ..... Uzbek
UJ8 ..... Tadzhik
UL7 ..... Kazakh
UM8 ..... Kirghiz
UN1 ..... Karelo-Finnish Republic
UO5 ..... Moldavia
UP2 ..... Lithuania
UQ2 ..... Latvia
UR2 ..... Estonia
VE, VO ..... Canada
VK .. Australia (including Tasmania)
VK1 ..... (See CE7Z-)
VK1 ..... Heard Island
VK1 ..... Macquarie Island
VK9 ..... Norfolk Island
VK9 ..... Papua Territory
VK9 ..... Territory of New Guinea
VO ..... (See VE)
VP1 ..... British Honduras
VP2 ..... Leeward Islands
VP2 ..... Windward Islands
VP3 ..... British Guiana
VP4 ..... Trinidad & Tobago
VP5 ..... Cayman Islands
VP5 ..... Jamaica
VP5 ..... Turks & Caicos Islands
VP6 ..... Barbados
VP7 ..... Bahama Islands
VP8 ..... (See CE7Z-)
VP8 ..... Falkland Islands
VP8 ..... South Georgia
VP8, LU-Z .... South Orkney Islands
VP8 ..... South Sandwich Islands
VP8, LU-Z ... South Shetland Islands
VP9 ..... Bermuda Islands
VQ1 ..... Zanzibar
VQ2 ..... Northern Rhodesia
VQ3 ..... Tanganyika Territory
VQ4 ..... Kenya
VQ5 ..... Uganda
VQ6 ..... British Somaliland
VQ8 ..... Chagos Islands
VQ8 ..... Mauritius
VQ9 ..... Seychelles
VR1 ..... Gilbert & Ellice Islands & Ocean Island
VR1 ..... British Phoenix Islands
VR2 ..... Fiji Islands
VR3 ..... Fanning Island (Christmas Island)
VR4 ..... Solomon Islands
VR5 ..... Tonga (Friendly) Islands
VR6 ..... Pitcairn Island
VS1 ..... Singapore
VS2 ..... Malaya
VS4 ..... Sarawak
VS5 ..... Brunei
VS6 ..... Hong Kong
VS9 ..... Aden & Socotra
VS9 ..... Maldive Islands
VS9 ..... Sultanate of Oman
VU2 ..... India
VU4 ..... Laccadive Islands
VU5 .. Andaman and Nicobar Islands
W ..... (See K)
XE ..... Mexico
XW8 ..... Laos
XZ2 ..... Burma
YA ..... Afghanistan
YI ..... Iraq
YJ ..... (See FU8)
YK ..... Syria
YN ..... Nicaragua
YO ..... Roumania
YS ..... Salvador
YU ..... Yugoslavia
YV ..... Venezuela
ZA ..... Albania
ZB1 ..... Malta
ZB2 ..... Gibraltar
ZC2 ..... Cocos Island
ZC3 ..... Christmas Island
ZC4 ..... Cyprus
ZC5 ..... British North Borneo
ZC6 ..... Palestine
ZC7 ..... (See JY)
ZD1 ..... Sierra Leone
ZD2 ..... Nigeria
ZD3 ..... Gambia
ZD4 ..... Gold Coast, Togoland
ZD6 ..... Nyasaland
ZD7 ..... St. Helena
ZD8 ..... Ascension Island
ZD9 ..... Tristan da Cunha & Gough Islands
ZE ..... Southern Rhodesia
ZK1 ..... Cook Islands
ZK2 ..... Niue
ZL ..... Kermadec Islands
ZL ..... New Zealand
ZM6 ..... British Samoa
ZM7 ..... Tokelau (Union) Islands
ZP ..... Paraguay
ZS1, 2, 4, 5, 6 .. Union of South Africa
ZS2 ..... Marion Island
ZS3 ..... Southwest Africa
ZS7 ..... Swaziland
ZS8 ..... Basutoland
ZS9 ..... Bechuanaland
3A ..... Monaco
3V8 ..... Tunisia
3W8 ..... Cambodia
4S7 ..... Ceylon
4W1 ..... Yemen
4X4 ..... Israel
5A ..... Libya
9S4 ..... Saar
..... Albabra Islands
..... Bhutan
..... Comoro Islands
..... Fridtjof Nansen Land (Franz Josef Land)
..... Mongolia
..... Nepal
..... Wrangel Islands

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

The new year brings with it the impact of one more passing DX milestone — the first Novice claim to QSOs with all six continents! It's KN5ALA of Bellaire, Texas, and he lists contact with Antarctica for good measure. Del uses 15 meters, of course, with a Ranger, S-76 and RME preselector. His antenna? Right out of *QST*. See W1ICP's "One-Element Rotary for 21 Mc.," p. 30, January 1955 issue, a skyhook already good for over 50 countries at KN5ALA.

To work 'em is one thing; to get their QSLs, another. KN5ALA has a good start, all right, but the race for that first Novice WAC diploma isn't over until that first valid set of QSLs shows up at 38 La Salle. May the most astute WN/KN DX man emerge victorious!

—···—

Our most recent DX quiz (June '54 *QST*) drew forth such lively interest that we really ought to try another without delay. So we will. And this time we'll give it a modest technical tinge. If you've been cracking your ARRL *Handbook* and *Antenna Book* regularly you should make out with a passing grade.

Which of the following suppositions are fibs?

1) The recent sunspot minimum produced reports of true skip on 160 meters. An amateur band at 320 meters, however, never would demonstrate true skip.

2) Flat feed lines are fine and dandy but any good radiator ought to have standing waves on it.

3) If VS4BA receives on 20 with a vertical, U. S. stations radiating vertically-polarized signals should have a big jump on the horizontal boys in raising him.

4) So-called one-way skip is a fact. Shortwave transmission-reception paths are not invariably reciprocal.

5) Detuning a resonant antenna is bound to reduce its efficiency as a radiator.

6) A 28-Mc. dipole transmits 28-Mc. energy as efficiently as a like 3.5-Mc. dipole radiates 3.5-Mc. energy. But it does not receive with such equal efficiency.

7) Frequency-modulated 'phone signals suffer less distortion from the effects of selective fading than do amplitude-modulated 'phone signals.

8) Pruning the feed line at the transmitter coupling point is one way to reduce swr on the line.

9) When using one of any two antennas in field proximity, the unused system should be grounded if interaction between the two systems is to be minimized.

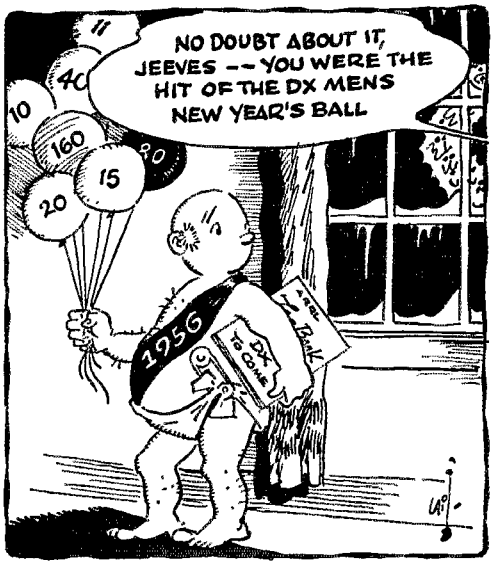
10) Generally speaking, W1 DXers are hit harder than W4 DXers when magnetic-storm disturbances come along.

Well, what did you expect — Element Nine? For extra credit sign up with Revlon. Anyway, only assertions 1, 4, 6 and 10 are on the up and up.

What:

15 'phone, undeniable cynosure of the DX world in early 1956, continues its rapid ascent in the estimation of DXers on every continent. *What* a band! W9WHM, who once swore by 20, daubs the first stroke on our 21-Mc. 'phone canvas this month: CT3AN (255), EAs 8BO (180), 9AZ (240), FB8s BC (200), BZ (180), FF8AK (200), HA5KBA (310), I1BLF/Trieste (200), KM6AX (255), OQ5AG (225), PZ1RM (130), SP9KAD (300), VK9DB (200), VP8BD (190), VQ3DQ (400), ZB1EB (305), ZDs 1SW (245), 6RM (180), 4S7JB (390), 4X4FV (305) and 9S4AX (253). . . . . CR9AH (240) 13, EL3A (200) 17, JAs 1ANG 3AQ 3BN 4AH 6MG, KAs 2AK 2KS 2LZ 2NY 8AB 8SD, KC6CG, KR6PI, VP1SD, VQ4EO, VSs 2BD 6CW (130) 1, 6AE, ZP5JE and many additional Oceanians dropped in on W6ZZ . . . . . K2CJN, another 20-meter renegade, clicked with CR7AD, IS1CYZ, VQ2RH, VU2EJ (285) 14, YU1AG and others already mentioned . . . . . W9ICL chips in CR6BX (229) 21, GD3GMH (280) 14, VPs 2GG (225) 22, 8AQ (175) 22, ZSs 3AB (205) 20 and 9G (130) 20, with CT3 FF8 VQ3 VQ5 ZD1 and 4S7 tossed in for good measure . . . . . DU7SV, GD3ENK (215) 18, KA2KS, TA3US, VQ3ES (280), ZE2KR and ZS3BC tickled W5UBW, whose Nov. *QST* c.w. tally really belonged in the 15-meter A3 rubric . . . . . W7PEG tackled JA3BB, KR6AF, TG9JW, VP7NA, ZP5IT. VP8 VS6 and 4X4 items . . . . . GD6IA (225), TG9AD and a VQ3 were happy to catch VE7AIH's 35-watter . . . . . The Ranger and 40-meter skyhook at W4GUV turned in OQ5BQ (175) 21, VQ4s EU (180) 18–19, RF (150) 17–18 and ZD4BQ 22. . . . . Good 21-Mc. fishin' here and there, at *K2BZT:* GD3IBQ (190) 17, YO3GL. *W4NQM:* FB8, IT1BXX, KM6 KR6, MP4BBL, VK9 VQ3 ZD6, ZC4RX. *W4WVM:* CT3, EA6AS, KA KM6 KR6, ZD4BV. *W7WJB:* CR9 KC6 KM6 KR6 VS6, VPs 6GT 7NG . . . . . NNRC, WGDXC and NCDXC specify CNs 2AD (230) 17, 2AN, 8CS (180) 19, 8DT, CP5EK, CR6s AO (230) BC, CS3AC, EAs 8AX 9EE, ELs 2A, 5A (235) 21, 12A, FAs 3JW, 9RZ (245) 20, FM7WQ, FQ8AG (210) 20, FY7YE 15, KA2s DW GS, KR6BF, KT1WX (204) 18–19, KV4s BB BI (300), KW6BX (240) 1, OE5CK (225) 17–18, OQ5s BI (210) 20, BP CX (170) 19, GT (140) 19, HH (204) 18, PZ1RM, SP9KAD (283) 14, SVØWO (250) 16, TG9TU (245), UB5KAB 20, VK9DW, VP7NK (220), VQs 2FU (165) 21, 4AQ (205) 20, 4ERR, 4FK (205) 20, 5EK (204), 5FS (220) 9, YU3JN (180) 16, one ZA1AB (200) 15, ZBs 1AJX 1S 2P, ZDs 2JDB, 9AD (150) 18 of Gough Isle, ZEs 1JE 2JK (180) 18, 2JV (190), 2KJ (245) 20, ZPs 5IB (200) 1, 7AX (215) 0, ZS3G, 4X4s DK (180) 16 and LP as tempting 15-meter vocal tidbits.

15 c.w. Well, be assured that the cool cats are makin' a killin'. And, just as was to be expected, as the 21-Mc. 'phone segment saturated itself, modulators were turned off and bugs brought into play. A swift swish across the band can bring you QSLs from EAs 6AF 15, 9AP (87) 16, GC3EML (100) 13, HA5KBA 16, IT1TAI (81) 16, JAs



* 4128 North Tripp Ave., Chicago 41, Illinois.

1CR (50) 21, 3AB (70) 21, **SPs** 3PK 17, 5AR 16, 9KAD 17, **TF3MB** (110) 13, **VQ4SS** (130) 17, **YO3s** LM 14, RD (100) 5, **ZB2I** (63) 13, **ZC4IP** (80) 12–14, **9S4s** AX (90) 17, BN (75) 15 and **HZ1HZ** (83) 16 if you have K2BZT's good fortune. Hayden heard the HZ1 working WNØZQV — we'll have more to report on Novice 15-meter doings before we throw our "How's" bandswitch . . . . . W4GUV frolicked with **CR6BX** (50) 17–19, JA1CR, **KC6CG**, **PJ2AA**, **VQs** 2GW 19, 4RF (40–140) 19–21 and ZE3JP 17 . . . . . **OY7ML** and **VQ5EK** eluded W1CTW but Cal did polish off HZ HA TF YO 9S4 and JA3AB. The latter was W1CTW's first Japan two-way in 31 years of fishin' and Country No. 83 on 15 c.w. . . . . W3GNH relished **DM2s** ABL AEB, **FAs** 8CR 8DA 9RW, **PJ2AV**, **YN1KK** and YV5BJ plus hordes of other Europeans . . . . . W1PWK captured **FA3OA** 14, **HE9LAA** (60) 14–15, **LZ2KST** 15, **ZB1ID** 18, **ZD6RM** 19, **ZP6CR** 19 and 4X4IE 14 — not bad for a 40-meter man's third harmonic . . . . . **CR7LU**, JA3JM, TF5TP and **VS6DE** made vicarious use of DL4ZC's installation . . . . . **EL2P** (68) 18, **GD3UB** (30) 15, **VP8AQ** (88) 22–23, **VQ4KPB** (98) 18, DU EA6 HE IT 4X4 and 9S4 specimens will have skins nailed to W8DLZ's wall . . . . . K2EQD caught JA3AF (62) 0, **KA8AB** (50) 23, Trieste **I1s** BLF (81) 19, YCV (75) 18, **VP1KT** (30) 20 and **ZE3JP** (20) 19 . . . . . Ninety-six ARRL DXCC Countries List entities are checked off in W6ZZ's 15-meter log. CE4AD, **DU6IV**, **JAs** 1ANG 1CJ 1CO 1CR 1EC 1VX 3AQ 3BN 3JM 4AF 4AH 6MG, **KA2KS** and **VS6AE** kept Miles' dials whirling profitably . . . . . Snap auditing of ledgers around the circuit, at *W1WAI:* **LZ1KAA** (50) 11, good QSLer **XE1PJ** (83) 13. *K2KHZ:* many Euros, FA. *W4EVI:* **ZE4JE** 17. *W4YOK:* **CE1BD**. *W7WJB:* HA **OE5JK**, VP1. *W9FNX:* Euros galore. *WØPRM:* likewise, plus **FF8AJ**, **ZB1AY** (85) 18. *VE4DB:* **FA8IH**, **YU1AD** . . . . . The Novice trend toward 21 Mc. and the world of DX accelerates unabated. Fifteen now is a Novice dream come true — choice DX available and workable with QRP and modest antennae. KN/WNs 1EGS 1EHQ 1ELA 1END 1EOA 1EVN 1FFV 1FKE 1FKU 1FQA 1FRR 1GDB 1GJM 1GTO 1GZR 2MFY 2MHJ 2MUS 2MZM 2ODC 2OUM 3BWU 3CDK 3CSL 3CSS/3 3DJW 3DWJ 4BFJ 4BOS 4CBK 4CEQ 4DFR 4ECS 4EMV 5BMX/5 8UKG 9AMT 9OPD and ØBXF poured good transatlantic signals into the 'phones of G3IDG over a three-week period . . . . . Random Novice jottings on the subject, at *WN5BWU:* **CX6CM**, **DM2ADL**, FA SP OQ VQ2. **VP9BP** for 30 countries. *KN5ALA: all continents*, CR6 VP8, **VR2CG**, ZB1. *KN6JQJ:* Euros, DU, **WH6BPE** . . . . . NC and WG DXCs fill out our 21-Mc. roster with the likes of **ET2AC** (80) 16, **FK8AC** (104) 4, **FQ8AG** (82) 19–20, **LZ1KPR** (30) 16, **UA9CC** (80) 10, **VK9DB** (50) 11, VQ4BY (50) 18–19, **ZBs 1AKX** (62) 17, **1TD** (36) 17, **2I** (25) 15, **ZD6BX**, **ZE6JT** 19 and **4X4FA** (50) 16.

10 'phone shares the kliegs with 15 at this stage of the game and the picture turns out well. A kw. on 28,502.1 kc. accumulated **CN8AF**, **CR6BH**, **VR2CG**, **ZD3BFC** (313), **ZE2JL**, 5A2TZ (490) and a hatful of VK/ZLs for W5UXP . . . . . **GC3EML** and **ZD6RM** (350) gave W1ICP some lip . . . . . W3KWH cornered **EAs** 8BO 9BH, **SVØWT**, **TA3US**, **ZC4RX**, **ZS9G**, **4X4BD** and 5A3TT . . . . . Hither and yon, *W2HEK* raised **ZD4BO**, **ZS3AB**. *K2AIN:* bizarre HZ8EY, TA2BL. *K2AJD:* Euros, ZSs, **KV4AQ**, ZE2KI. *K2EFB:* **CR7BB**, 4X4. *W3PXW:* ZSs. *W4GUV:* **HP3DA**, 5A2. *W5ZCC:* **CN8FN**, Euros, ZSs. *VE3BOH:* **CN8FD**, Euros, ZSs . . . . . NNRC designates **CN2AD**, **CN8s** AD 18, MM, **EA9AZ** 15, **GD3GMH** 22, **HI6EC**, **OQ5s** BW 18, OA RU, **VP1EE**, **VQs 2AT** (480), 2FU (320), 4EU (60) 19, **ZE2s** JJ 18, KE (265) 14, KR (130) and **ZS3E** (240) as seated ducks.

10 c.w., no longer just a legend on manufactured dials, provided dozens of Europeans, **FAs** 8DA 15, 9RZ 14, **PJ2AV** 16 and **ZE3JP** 16 for W4EVI . . . . . W4GUV got that ZE, too, while K2AJD put his skyhook into **GD3UB**, **IT1TAI** and **YU1AD** . . . . . W9QVY, opping club set-up W9OBV, finds Oceanians quite workable, but W2SHT preferred **HZ1HZ** . . . . . W1WAI's first crack at 10 c.w. amased him with consistent 1300–1900 GMT openings to Europe. We ain't seen nothin' yet!

20 c.w. is a good clean-up hitter for our Bandwagon line-up, reliable as always. **CE7ZE** (80) 1, **CR6s** AI (60) 21, CW (85) 22, **FB8s** BR (20) 15–16, BU (30) 16, **HA5KBK** (25) 17–18, **HZ1AB** (10) 16, **I1BLF/Trieste** (75) 20, **LZ1KAB** (10) 16, **MP4JO** (45) 17–18, **OY2Z** (50) 20, **UA3AC** (70) 15–16, **UB5KAB** (25) 16, **UC2AA** (55) 17, **VP8BC** (10) 2, **VQs** 4DT (95) 19, 6LQ (60) 15, 8AG (20) 15–16, 8AX (80) 18, **VS1FS** (50) 16, **VU2AL** (85) 2 on the long path, ship X1NP (35) 6, **ZC4RX** (90) 16–17, **ZD6BX** (80) 16, **ZE6JU** (35) 16 and a 3A2 returned the compliments of K6ENX. Otto received notification that he is to remain on the USN retired list — DX beware! . . . . . K2BZT chummed with **CR6s** CV (40) 17, DA (38) 18, HA5BL (25) 9, HZ1HZ (50) 20–21, **IS1FIC** (30) 18, VQ4GC 20, VQ6, **VS6CG** (99) 12, **VU2KV** (57) 12, **XW8AB**

JA6AO, one of the Orient's outstanding DX chasers, won the trophy in the foreground for turning in a recent 49-minute WAC feat. (*Photo via K2BSM*)

(13) 13 and **YO2VM** (33) 17 . . . . . **CN2AE** (65) 19, **ET3LF** (19) 19, **HP1EH** (60) 11, **JAs** 3BB (42) 12, 5AB (64) 12, 6AO (46) 12, **KA2s** OJ (35) 11, SK (25) 11, **LU5ZF** (60) 23, **MD5UK** (18) 20, **OD5AV** (17) 22, **OY4XX** (33) 16, **PZ1BS** (19) 20, **ST2NG** (92) 20, **VPs** 2KB (72) 18, 8BC (10) 23, **YO3RCC** (19) 67, **ZD2DCP** (40) 21, **4X4CK** . . . . . K2GMO, up to a quick 166, assembled Formosan **BV1US** (55) 14, **ET3AH** (57) 0, **VQ3FN** (63) 19. **VS6CG** (5) 14, **XZ2OM** (90) 14, **ZD6RM** (15) 18 and **ZS7H** (73) 1 and is spending the holidays in England . . . . . W9RBI wasted no time bagging Afghanistan's **YA1AM** (50–90) 14, as well as **LZ1KPZ** (90) . . . . . It's 160 at W6BIL **CN8EB**, **EL2L**, **FA8ZZ**, **FF8AJ** (55) 22, **I1BNU/Trieste**, LZ1KAA/P (45) 15, **ST2AC** (10) 4, **YO3RF** (77) 14, YUs and SPs assisted. **SUIs** CR IC (10) 15, REC, **HZ1TA**, **OD5LX** and **ZS3B** are still sought . . . . . At W1OJR we find many in addition to **CN8AS** (58) 22, **JA3AB** (40) 18, **KV4AA** (80) 20 and **ZS9O**, late Bechuanaland arrival . . . . . W8QXQ's Viking picked up **EA8BK**, **FAs** 8RJ 9VN, **FF8JC**, **FP8AP** (78) 12, **VP1FL** and **ZP5AY** and he's thinking about an outboard 813 annex . . . . . **FK8s** AH (28–72) 5–15, AO, HA5KBA (70) 15, **JAs** 1AA 1CB 4AC 6AA 6AD 7AD 7BO 7DK, KAs 2DS 2KS 2TT 2USA

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MP4QAL keeps cool and collected while collecting W/K QSOs on Halul Island.Or else he may be chatting with old buddies back home around Dublin town. (*Photo via W5ALA, West Gulf DX Club*)

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***QST* for**

8AB, KC6CG, KM6AX, LUs 1ZV 2ZV 5ZK, TF3AB, VP7NG, VQ2GW, VS1GX (60) 14, YV5BX, ZE2JC and roving *VP9CN/VP8* highlight W6UED's synopsis . . . . . Swift scansion of miscellaneous reports, from *W1BKF:* DU7SV (92) 9, one ZA2G (75) 16, ZD6 and 3A2 make 85. *W2GVZ:* XZ2 XW8 ZS9 3A2. *W2HSZ:* DU XZ2 ZD6 ZS9 3A2. *K2EQD:* KG1CG (72) 22, OQ5CP (65) 19, ST2NG (29) 20, VP2FC (27) 20, ZB2I (28) 20. *W3UXX:* GC2CNC, OXs 1TR 3RC, PI1F, SP6WM, 9S4AX (40) 15. *W3YUW:* FP8, VQ2W. *W4BFR:* KJ6AF. *W5CAY:* DU FP8, PJ2CJ. *W6ZZ:* KA9MF, VE8MD within 700 miles of the Pole. *W7UAB* of the newly formed Willamette Valley DX Club, Inc.: XW8, 3V8AN 21. *W9CLH:* DM2ADL. *W7UYZ:* DM2ACN, SPs 2CO 8KAF, YU3AT. *W9OBV:* CN8 FP8, YU1AD. *WØVFM:* 66 with HA. *VE4DB:* ET2AB (26) 6, VP2KB, VQ4DT (16–72) 14, YOs 3VA 6AL, ZD6RD (13–20) 14–18. *VO6AE* (G3JHZ): CR6CS (65) 20–21, OY2H (34) 13, UB5KBE, VR2CZ . . . . . The *DX Bulletin* (WGDXC) and the *DXer* (NCDXC) put us wise to the 14-Mc. c.w. antics of AC5PN (51) 14, AP2s B (40) 15, BP (52) 13, AR1s AN (22) 3, EN EW, CR6s AM (18) 20, AY (12–60) 18, CV 22, CR4AG (90) 2, CR7AF (47) 5–19, EAs 6AF (23) 20, 8BF (85) 2, 9AP (39) 0, ØAX (28) 22, ETs 2US (85) 15, 3GB (15) 4, F9YP/FC (65) 18, FD4BD (23) 23, FF8s BF (105) 22, BI (12–80) 22–23, FO8AB (50) 7, FQ8AX (25) 23, FW8AB (21 t8c) 4–5, HA5KWA (63) 19, HC8AA (80), HE9LAA (38) 12, HIØTG (51) 4, JZØBS (50) 16–17 of Biak, KJ6FAB (70) 2–3, LUs 4ZG (32) 20–21, 6ZT (38) 2–3, LX1CW (40) 19, LZ2s KSK (15) 18, KST (20) 17, MD5RS (67) 0, MP4s BBE (80) 14, QAL (65) 14, OQ5PE, OX3UD (56) 18, PI1LC (90) 22, PZ1CD (20) 0, SVØs WL (15) 19, WR (16) 16, WU (62) 13, TF5TP (60) 23, UAs 6AF (50) 13, 6UF (63) 14, 9DH (23) 15, 9DN (60) 14, 9OC (39) 13, 9YE (55) 13, ØKAD (50) 13, UB5s CI (50) 16, KBD (33) 12–13, KEP (40) 13, UH8KAA (54–80) 13, UJ8AG (44–80) 13–15, UQ2KAA (36) 13–14, VKs 1AWI 1RA (83) 1–15, 1ZM (103) 13, 9WP (56) 13, 9RM (82) 13, VPs 1VR (9) 1, 2DC (25) 0, 8BL (50–89) 2–3, VQs 3CF (25) 8CB (50) 12–13, VR2AG (32) 3, VSs 2DW (49) 16, 4BA (52) 15, 6CO (55) 13, 6DE (37) 13, 6DI (35) 13, VU2s AS (44) 14, BK (25) 14, EJ (25–60) 13–14, HF (51–75) 13, JA (68) 15, JG (58) 14, JK (20) 13, JV (15) 16, MA (90) 12–13, NR (14) 13, RT (81) 14, RX (35) 13, SX (30) 13, XZ2AD (85) 15, YI2AM (20) 13, ZB1s DHF/XZ (113) 13, TB (82) 19, ZC4s CK (60) 14, IL (21) 16, IP (66) 13–14, ZDs 2FNX (15) 21, 3A (59) 23, 4BT (24) 0, 3V8AB (20–50) 7–18, 4S7GE (50) 3, 4X4s FV (75) 17, GS (84) 13 and mercurial FB8XX (48) 13–15 . . . . . Milwaukee ARC's *DX Notes*

KR6LJ's 520 contacts in last year's ARRL DX Test netted him the Ryukyus Islands championship and a score for Asia second only to that of JA1CJ. Frank prefers his noncontest DXing on 15- and 20-meter frequencies, A1 or A3.

contributed several of the preceding Who's On, and hints that a VQ1 will be available during the coming ARRL DX Test. Watch for ZC5CA, too.

20 **'phone** retained its parol pre-eminence although many of its star DX performers were lured away by sirens 15 and 10. W9WHM stuck around for ET2LU (180), KP6AK (240) who is sole Palmyra resident, OK1MB (180), SP5AH (108), SVØWM (110), VP8AQ (110) and ZD4BO. KP6AK causes Jeeves to wonder if any other ARRL DXCC List country has a populace 100 per cent amateur . . . . . KG1FR and VP2DA were new ones for W8QXQ . . . . . VK1AWI of Mawson Base and ZC5CT boosted W9RBI's terrific total further into the ionosphere . . . . . W6SYG has the VR6AC operating pattern as 0400 GMT Tuesday, Saturday, and occasionally Wednesday, 14,143 kc. . . . . A3 efforts at W6URD turned up JA1CB, KAs 2WW 5CL, VS2DW, XE3AF and XZ2OM (100) 14 . . . . . EA6AR, F9WT/FC, F9YP/FC and YO3GM attracted K2CJN . . . . . W8KAK trapped FA3GZ (180) 12, FY7YE (170) 12, HC8GI (179) 2 of the Galapagos, HH2JH (160) 12, TF2WAN (180) 22, VP1VR (178) 23 and others . . . . . SWL G. Chatfield found GC6FQ, KV4BI, OQ5AO, SVØWN, TF5SV and 4X4FV busily bending ears . . . . . The boys at CS3AC (310) can't break through to Norfolk's tantalizing VK9RH when they really try, but the VK9 popped back one day unexpectedly. 'Twas ever thus . . . . . WGDXC's detector

HP1EH, ex-HO1EH, is Haitian ambassador to Panama. Louis usually is found in pursuit of ARRL WAS and DXCC credits around 14,080 kc., c.w. preferred. (*Photo via W2MUM*)

detectives throw light on 20-meter 'phone work by ACs 3SQ (110) 14, 5PN (110) 14, CN8HG (154) 19, CRs 6AO (130) 22–23, 6AU (157) 22, 7AD (147) 4, 7DI (156) 22, DU1CV (145) 15, EA8AI (150) 1, ETs 2US (180) 19, 2XX (184) 21, 3TRC (108) 14, FB8s BC (125) 3–16, BP (142) 3–4, RG (162) 3–4, FF8AK (155) 0, FO8AD (110) 3, FP8AP (343) 15, GDs 2FRV (130) 14, 3GMH (150) 0, HZ1SD (178) 3, KJ6FAB (260) 4, MP4JO (186) 16, OQ5FH (150) 3, ST2DB (145) 22, SVØWB (130) 14, TA3US (110) 22, TF2s WAM (115) 13, WAU (110) 1, VP8BF (140) 1, VQs 5FS (126) 20, 6LQ (184) 3–4, 8AL (120) 3–8, VS2CB (120) 15, VU2s AK (160) 14, EH (135–175) 14, XZ2SS (150) 15, ZD4BR (115) 22, ZEs 1JX (110) 4, 6JJ (160) 3, 6JQ (135) 3, ZSs 2MI (187) 13–14, 9G (130) 5, 3A2BE (125) 15, 5A1TM (122) 19, 4S7WM (111) 17 and 9S4AB (109) 15 . . . . . NNRC clinches the 14-Mc. A3 story with notes on CP5ES. CRs 4AG (155) 21, 6BX 7CO, CT2AG, EAs 8AI 8AP 9AW 9AZ 9DF, F9JD/FC (200) 16, FAs 3GQ 9WD, FF8BL, FM7WF, GD3FOC (143) 12, HA5s BC BI 19, HI6EC, HZ1TA, IS1CYZ, IT1BXX, JA6AK, KAs 2GH 2WA 6AK (180), 7AL, KG6SB of Saipan, KJ6FAA, KR6s KS QO QW, KT1PU, KV4BD, KX6BU, LX1DU 12, MP4BBV, OD5AB, OQ5AN, PJ2s AF CH, SP5KAB (122), TG7CB, UB5KAB (120), VKs 1DC (150) 5, 9BS, VPs 1AB 1EE 1EK 1HA (173) 16, 2VA (180) 18, 3VN, 7NV (205), 8AQ, VQs 2FU 4ERR 4FK 4RF 8AB 21, VR4AB, VSs 1CZ 6CG 14, 6CL (295) 13, 6CW (100) 6, XZ2AL 11–12, YIs 2AM (145) 21, 3WW (125) 15–16, YS1MS (185) 10, ZB1BI, ZC4RX, ZDs 3BFC 4BR 4BV 6JI (170) 19, ZP5s CD CG, ZM6AT, ZSs 3HR (160) 14, 7C, 4S7WR 19, 4X4s BK DY (150) 18. GB, 5A2s TL 23, TZ (170) 17 and 9S4AB.

40 **c.w.** deserves our attention next. After selling his chunk of W2RDK antenna space back to the Indians, W8JSU sicked his 60-watter on HR1JZ (12) 4–5, LZ1KNB (6) 4, PZ1BS (7) 22–5, SP9CS (8) 4–5, TG7CB (21) 4, VQ4EO (1–49) 4, YO6AL (15–21) 4 and a 3A2 . . . . . KR6NZ (140) 16, KV4BK (25) 16, JAs 1AGS (15) 15, 2DL (15) 14, 4AZ (20) 14 and others came back to K6HFA's 65 watts . . . . . W1APA gained CN8MM, EAs 6AF 9AP, FA8s CR DA, HA5s KBA KBN, IT1TAI, LZ1KAA/P, SP9KAD and VP7NG in quick succession . . . . . OA5G, YO3RF and 3V8AN looked good to W3WPG but CR6AI and HP1EH got away from Harold . . . . . W4EUH charmed HR1AW, LZ1KAB and YO5LC . . . . . CR9AI, LUs 6ZT 7ZT, VP8BE, VS1BJ, ZC2CC and ZK1BG hit it off well with K6DV's 500 and ground-plane . . . . . WØVBS worked PJ2AC 23 and YV5BJ 7, heard CT2BO 2 and PJ2AN 1 . . . . . DM2ADL, EA6 EA9, LZ1KDA (27) 1, SP6s BW (25) 20, WM (25) 20, TF5SV (7) 0 and 9S4CH (37) 21 replied to K2BZT . . . . . K6ENX sampled VK9DB (15) 16, ZSs 3K (30) 5 and 7D (20) 16 . . . . . LZ1KSZ 2, OY2Z 0, XE1AB 11 and VP1VR rattled W1PWK's headset . . . . . KN6JQJ collected KJ6BG (191), KM6AX (195) and WH6BGU (187) with nifty Novice net work . . . . . Here and there on 40, *W1AMY:* PJ2AV (50), Euros with an AT-1. *W1ORP:*

cracked the electronic curtain for **UA2AO** (23) 21, **UB5EE** (10) 23 heard **UG6AB**. *W1WAI:* **FA3OA** (1) 0, **HK3KG** (53) 2, *W2ZOL:* **VK6WT** (43) 12. *W3SOH:* **LU4ZK**, PYs. *W4ZWZ:* **HH5EA** 5, **HK5HN** 5–6. *W6UED:* **JAs** 1CR 1NI 7BO. *W9OBV:* **YO3RF**, *DL4ZC:* **PJ2AA**, **TF2WAY** . . . . NCDXC adds **UA0s** KFC (30) 9, GR (3) 15 and **ZS7J** (4) 15 to the 7-Mc. c.w. stew.

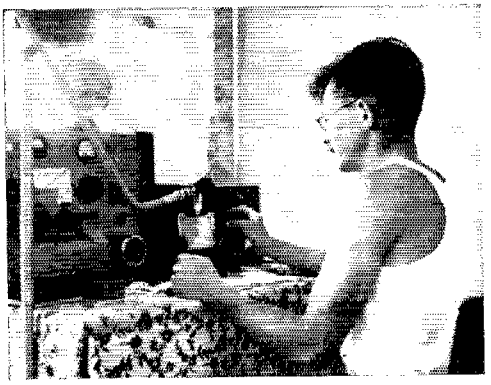
40 phone work demands a rugged constitution. W1APA hung on for CT1 DL/DJ EA7, **I1BNU**/Trieste (60) 4, KH6 KL7, **LU8HAM**, **OE5CK**, **VP7NS**, **YV1AI**, VKs and **HH4MV** . . . . W4TDZ's two-element Mosley picks off VKs and ZLs with apparent ease; **KM6AX**, KH6s en masse and W5SZN/**KG6** also bit . . . . NNRC tuners fell upon **HH5JK**, **HP3FL** (198), **JAs** 1AGF 1ANR 1AKX 1APZ 1BL 1PW (140) 14, 2JR 3MD 5HE 8EW (85) 14, 9BY (35) 14, **TG9CB**, **TI6AL** and **ZS6BW** among the raucous b.c. sidebands.

80 c.w. and neighbor 160, beleaguered by burgeoning sunspot activity, haven't much to say for themselves at this writing. VE1ZZ, lone 3.5-Mc. wolf, gleaned **CN8MM**, **GD3UB**, **HA5KBA**, **LU8ZA**, **LZ1KDP**, **MP4BAA**, **MD5UK**, **OYs** 5S 7ML, **PJ2AN**, **SP9CS**, **SVØWT**, **VPs** 4LZ 8BD 8BH, **YO5LC**, **9S4AX**, numerous VKs and ZLs during the wee hours between 3500 and 3550 kc. Eighty-meter DX no longer comes easy — you have to *dig* for it . . . . The season's 1.8-Mc. activities are in the formative stage and battle lines are drawn. W1BB's recent terse dispatch from the 160-meter front reports the top-band noise level even higher this year thanks to new loran emanations.

Where:

No. California — DXC's *DXer* calls attention to GD3ENK's bid to deliver all pasteboards incoming to the Isle of Man . . . . W6OXS, faced with the task of shipping out hundreds of HHØA and W6OXS/VP2 confirmations accruing from 1955 Caribbean activities, requests that stamped self-addressed envelopes accompany all correspondence relating thereto . . . . Via K2DSW, ZB1AY defines his outgoing-QSLs routine as a once-per-week arrangement via bureaus. Thus he never accumulates more than a seven-day backlog — and ZB1AY garners *plenty* of QSOs. We recommend such a progressive QSL policy for the consideration of all amateurs, rare DX or otherwise — except, of course, in locations where weekly mail service isn't . . . . NNRC's *Bulletin* reports G3GFM in possession of ZB2A logs dating from November, 1953, through August of last year . . . . VR6AC personally attends to outgoing Pitcairn QSLs to foreign points; W6SYG continues to do VR6AC QSL chores for U. S. and Possessions and welcomes inquiries on the subject. Frank finds that certain VR6AC log entries aren't too clear. If your card hasn't shown up, send W6SYG full QSO particulars for recheck . . . . W6RRG reports completion of his VP7NX QSL labors and has sent out some 3000 cards via bureaus. If yours doesn't arrive in reasonable time, inquire of W6RRG via P.O. Box 75, Oakland, Calif. . . . . W2JIL and W1IPQ take up ARRL QSL Bureau managership batons from W2SN and W1JOJ, respectively. The gratitude of all DXers goes out to the latter twosome for grueling jobs well done. W1OJR, who assists W1IPQ and XYL W1RTB in the New England bureau branch, opines that the gang should be more cooperative in submitting proper envelopes as stipulated by the legend in *QST*'s regular Bureau listings . . . . Do you waste time digging into these back-*QST* "Where" rosters every time you work a DX station with an unlisted QTH? One way to conserve valuable DXing time is to file 'em as each new column comes along. For instance, go right down the line and plug them into your most recent *Call Book*. It isn't necessary to transfer the full QTH; just "VS4NW Jan" will give you quick reference. The "ex-" listings can be ignored, for these are only of immediate value. Here's where 15 or 20 minutes invested systematically once each month can save you possible hours of subsequent scramble . . . . W1s APA ICP OJR RDV UED WAI WPO, W2s GT GVZ KZE, K2s BU CJN DSW EQD GMO OAH, W3s RNQ SOH, W4s EUH HYW WXZ, WN5KNE/DL4, K6ENX, W8s DLZ KAK QXQ, WØVFM, VE4DB, DL4ZC, NCDXC, NNRC and WGDXC deserve your plaudits for rounding up postal patter bearing on

CR6DA, Box 1318, Luanda, Angola . . . . **CX1DB**, U. S. Embassy, Montevideo, Uruguay . . . . ex-**DJ2JA** (QSL to W5VNC) . . . . **DL4YH**, C. E. Biele (W2AOS-W3ENK), APO 757, New York, N. Y. . . . . **EA4URE** (QSL via URE) . . . . **F7EF**, APO 258, New York, N. Y. . . . . **FA3LW**, H. Piazza, 1 Rue General, Maurial, Oujda, French Morocco . . . . **FF8AK**, C. Laget, P.O. Box 1697, Dakar, F. W. Africa . . . . **FF8BC**, Box 1175, Abidjan, F. W. Africa . . . . **FF8BI**, J. Claude, Box 978, Abidjan, F. W. Africa . . . . **FQ8AV**, L. Le Cocq, Aeronautique Civile, B.P. 218, Brazzaville, F. E. Africa . . . . **FQ8AX**, J. Rozier, P.O. Box 218, Brazzaville, F. E. Africa . . . **GB2RS** (QSL to RSGB) . . . . **GBM** (QSL via G3JUL or RSGB) . . . . **HB9ET**, K. Ruesch, Post Box 2, Cointrin, Geneva, Switzerland . . . . **HH2JH**, J. C. Holland, P.O. Box 961, Port-au-Prince, Haiti . . . . **HH2OT** (QSL via W4HYW) . . . . **HR1AW** (QSL via HR1AT) . . . . **JA1ATW**, K. Shiatani, 627 Isumi-cho, Suginami-ku, Tokyo, Japan . . . . **KA3EB**, C. Bentley, Box 1, 6101 Field Mntn, Gp., APO 157, San Francisco, Calif. . . . . **KG1CG**, CO, Loran Stn. USCG, APO 23, New York, N. Y. . . . . **KG4AN**, J. W. Halloway, Navy 115, Box 55, FPO, New York, N. Y. . . . . **KL7AES/KL7**, Box 967, Fairbanks, Alaska . . . . **KL7AON**, (QSL via KL7TI) . . . . **KL7BIQ**, CO W. E. Unit, APO 722, Seattle, Wash. . . . . **KL7BPG** (QSL via W3WV) . . . . **KZ5LC**, Box 736, Balboa, C. Z. . . . . **OK1KPI**, L. Zoch, 1528, Pisek, Czechoslovakia . . . . **OK3KTR**, L. Ondris, Kollarova 1, Trnava, Czechoslovakia . . . . **PX1U** (QSL via REF) . . . . ex-**ST2NW** (QSL to VS4NW) . . . . ex-**SU1GY**-ZE2KL, G. Metcalfe, G3JDC, Green Hills, Skelton, Penrith, Cumberland, England . . . . ex-**SVØWM**, M/Sgt M. L. Carmichael, W6TBJ, Box 331, Arcadia, La. . . . . ex-**TF2WAN**, S/Sgt P. Tolley, Box 353, Cranberry, N. C. . . . . **TF2WAS**, 933rd AC&W Sqdn., APO 81, New York, N. Y. . . . . **TF2WAU**, APO 81, New York, N. Y. . . . . **TG9TH**, P.O. Box 115, Guatemala City, Guatemala . . . . **UA6KOB** (QSL via DM2ADL) . . . . **UB5KAB**, Box 27, Stalino, Ukraine S.S.R. . . . **UG2AA** (QSL via DL7AA) . . . . ex-**VK1DJ** (QSL to VK7DJ) . . . . ex-**VK1DY**, G. Delahoy, VK3ADZ, Eden Park Road, Whittlesea, Victoria, Australia . . . . ex-**VK9OK**, L. J. King, VK2AOK, 24 Anderson St., Chatswood, N.S.W., Australia . . . . **VK9TZ**, C.



You don't work much 21-Mc. phone nowadays without crossing 4X4BL's 25-watter and two-element beam. Tzvi helps represent Israel on 14 Mc., too, where a long-wire does the radiating. That receiver is a BC-342 and the QTH is Ayanot, near Haifa.
(Photo via K2IXD)

D'Evelynes, Rugli via Baiyer, Lae, T.N.G. . . . . **VO6AE**, P. J. Brisbar, 923rd AC&W Sqdn., APO 677, New York, N. Y. (or via RSGB) . . . . **VP4BN**, J. Bardon, Navy No. 117, FPO, New York, N. Y. . . . . **VP8AI**, A. S. Betts, Box 117, Port Stanley, Falkland Islands . . . . **VP8BH**, c/o Postmaster, Port Stanley, Falkland Islands . . . . **VS1GW**, J. W. Mitchell, No. 2 Sgts Mess, RAF M.B., Seletar, Singapore . . . . **VS4NW**, C. N. Weber, International Aeradio Ltd., c/o Postmaster, Kuching, Sarawak via Singapore . . . . ex-**VS9AO**-MT2E-5A2CO, H. Orrell, G3JHO, 167 Southbury Rd., Enfield, Middlesex, England . . . . **VU2SX**, St. Xavier's Technical Institute, Cruickshank Rd., Bombay 1, India . . . . ex-**W2AOS/KG6** (QSL to DL4YH) . . . . **XE2NT**, G. Eichelmann, P.O. Box 295, San Luis Potosi, Mexico . . . . **ZB1EB**, E. Briggs, 75th AMQ, BFPO 51, RAF Stn., Luqa, Malta . . . . **ZB1PP**, R. J. Ezra, 3rd Commando Brigade, Hq., BFPO 51, Luqa, Malta . . . . **ZB2A** (QSL to G3GFM — see text preceding) . . . . **ZB2L** (QSL via G3GFM) . . . . ex-**ZC2PJ**, P. J. Reeves, 285 Galle Rd., Colombo 4, Ceylon . . . . **ZC6UNJ**, Box 490, Jerusalem via Israel . . . . ex-**ZS1PD**, H. de Wet, P.O. Gadzema, So. Rhodesia . . . . **ZS6ANZ**, 96 College St., Mayfair, Johannesburg, U. of S. Afr. . . . . **ZS7H**, G. Smit, GPO, Hlatikulu, Swaziland, So. Afr. . . . . **ZS9O**, Box 23, Francistown, Bechuanaland, So. Afr. . . . . ex-**5A4TT** (QSL to MP4TAA).

Whence:

Asia — CR9AH is really livin' once more since his favorite bands, 10 and 15, came back into their own. John sports a parallel-807s 120-watt arrangement firing into two-element rotaries 50 feet high. He twirls these beams with

the ubiquitous B-29 prop-pitch motor and receives with a preselector-converter combination ahead of an AR-77 at 3.5 Mc. "The only other station here in Macao is CR9AI who is active on 14-Mc. c.w. CR1ØAA is leaving Timor to work in Darwin, Australia, so I think that is the last of CR1Ø until a new fellow goes over there to start up a ham station." .-.-.- OD5AF, ex-MP4QAJ, tells W2GT he's temporarily closed down for a U. K. holiday spree .-.-.- Don't go sleepless over this one, but UAØKTI is reported active in Tannu Tuva .-.-.- Two new DXing awards are offered by FEARL (Japan, U. S. Military). They are WFKAS (Worked Five KA Stations) and WSKAD (Worked Seven KA Districts), which diplomas are designated to replace the old WFJS and WAJAD trophies. KA districts correspond to call areas running from KA2 through KAØ — JA QSLs are not valid for these certifications. For up-to-date complete details write Far East Auxiliary Radio League (M), P.O. Box 111, APO 500, San Francisco, Calif., for the attention of KA2CA, FEARL awards manager .-.-.- From W6YZA, ex-W4SDJ, now stationed in Seoul: "The new Minister of Communications for the Republic of Korea has indicated that amateur operation may be opened again here in the near future. An exam for operator license was given as early as last September, but no station license exam. Next examinations are scheduled for February." At this writing Korea still is a member of the shrinking ITU-FCC banned group, so let's hope Mr. Minister soon goes through the proper channels for rectification .-.-.- W6CRV, back from Saudi Arabia and stationed at California's March AFB, reminisces of his 1955 HZ1AB hamming. "I ended up with 104 worked and, because of the slow HZ mail situation, had only 53 confirmed. At least I did add about 25 new countries to the total HZ1AB list. . . . It was a lot of fun and the thrill of 'DE HZ1AB' will never be forgotten." Ron became sold on s.s.b. while tuning the American 'phone band from APO 616. W6CRV now features a 20A with slicer and, after completing a linear final, he'll be after an s.s.b. DXCC. Meanwhile, K4DCC maintains HZ1AB's high level of ham activity back in the Near East .-.-.- W3s KDI and LMZ will accompany a solar eclipse observation team to Ceylon this year and firmly intend a bit of hamming somewhere along the way (QSL via ARRL) .-.-.- PAØNU confirmed a Korean QSO with one KA3BX last year — doubtless thought he had another ordinary Japan contact. N.g. for DXCC purposes, anyway.

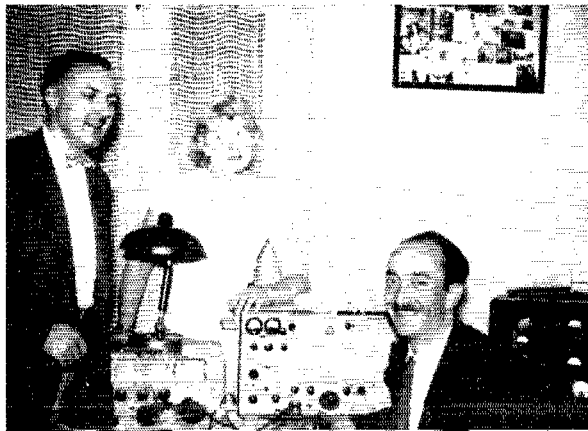
Africa — The Comoro Islands, you know, are virgin ARRL DXCC Countries List territory, and the first bird to fire up there is due some form of DX immortality as well as possible r.f. burns. FB8BR, who schedules W7PHO thrice weekly, was all set to put the Comoros on the air last November — even made the trek. Laments FB8BR: "It is necessary to be a resident of the islands to put a station on the air and, although my brother-in-law is Governor, I still could not get a license. I am contacting Paris to secure necessary permission and should be on from the Comoros during February or March." The apparent lack of reciprocal licensing privileges between Madagascar (French) and the Comoro Islands (French) is interesting. The Comoros are of volcanic origin with a land area of 790 square miles and a population of over 100,000. Several other DXers have burning ambitions to operate on the islands in 1956 but FB8BR certainly seems to have the inside track. Next month? Maybe. . . .

Oceania — VS4BA is knocking 'em dead from Sarawak after cracking U.S.A. ice with a W8BRA QSO. Dick writes: "Things are *rolling* into the shack now — the first day I opened up I found myself in a jam session! The previous 6L6 rig was a dead loss for DX work; its greatest distance was half a mile. But now I've got a medium-power transmitter using 6AQ5–6AQ5–807 modulated by two 6L6s." VS4BA inhales with an unpedigreed 11-tube superhet. VS4NW (ex-ST2NW) is in the neighborhood, too, so Sarawak should be well represented DXwise in '56 .-.-.- K2BU reports VP2VB/P still heading westward aboard yacht *Yasme* after beating through HC8 environs. For shipboard work Danny sticks fairly close to 15 meters .-.-.- K2OAH has it that VK9OK, returning to VK2-AOK, left Norfolk Island hamming in the able hands of VK9RH. Also, VK4IA supplants VK4IC as prime Willis Islet active.

Europe — Long-time Azores operative CS3AC now peddles contacts under the auspices of K6CWG, WØRKS and Dave Wieder (no call). The call-holders are Navy men while Dave is of USAF extraction. CS3AC's signal is nourished by 400 watts, a four-element spinner and the receiver is a 75A-2. CS3AC, whose 'phone is regularly available on 14,310 kc. at 0730–1000 and 1130–1900 GMT, prowls for WAS holdouts Montana, Wyoming and Idaho. "We QSL 100-per and encourage fellows who do not receive our cards within reasonable time to give us shouts for replacements. We also get our share of SWL cards and try to answer them." .-.-.- W2AOS–W3ENK is back on the DX circuit again, this time as DL4YH. You may have worked Chas. as KZ5CB and/or W2AOS/KG6. DL4YH, always 100-percent QSL, has a Pygmy Powerhouse 40-watter and 66-foot wire on 40 and 20 meters .-.-.- EA4URE was operated at Madrid's National Exposition of Telecommunications in early November by EA4EP and other EAs. A 120-watt 'phone on 14 Mc. really wowed the visitors, according to WN5KNE/DL4 .-.-.- Long-term Greece DX man SVØWM shut down in November for return Stateside. He holds the call W6TBJ but possibly will be tagged otherwise when his U. S. assignment is finalized. If you're shy a deserved SVØWM confirmation send full QSO data to Marvin via the address in "Where" .-.-.- Postwar ham radio in Greece has been limited almost exclusively to noncitizens. This peculiar paradox will end shortly when native Greek amateurs become active under recently inaugurated regulations .-.-.- F3IB, a member of the '55 PX1EX group, states the gang will provide an encore this year, a performance tentatively scheduled as a two- or three-week August engagement .-.-.- HB9KB's recent 14-day billing as 3A2BH resulted in 2008 QSOs, all by continuous waving. These break down to 211 contacts on 3.5 Mc., 476 on 7, 1229 on 14, and 92 on 21 Mc. G3JBR was the No. 1 customer. The station was set up in the room occupied by 3A2AD in 1951. Power breakdowns were rife; resident 3A2AH valiantly came to the rescue with the loan of a transformer on the most serious of these occasions. HE9-RDX, HB9KB's chief DXpedition chronicler, declares "Monaco is not well situated for propagation, with mountains climbing to almost 4000 feet. Conditions were very erratic for HB9KB and many openings to the States were of only a few minutes duration." HB9KB did the trick with his well-traveled 813 rig, 75A-1, a 14-Mc. ground-plane which doubled on 21 Mc., and a random-length wire for 40 and 80 meters. Well done! .-.-.- DL4ZC reports considerable liberalization of Hungarian amateur regulations as of September last, noting during his recent Budapest visit that "Almost all individual HA stations are homemade, including receivers. All Hungarian hams are required to keep station logs in duplicate, using a special log prepared for that purpose. Each must submit a copy to the government for inspection at periodic intervals." .-.-.- WG-DXC couriers report from the Faeroes. OY3IGO is still QRT but OYs 4XX (7 Mc.) and OY2H remain quite active. OYIs P and R hit the air on occasion.

Hereabouts — W4HYW's friend W4NL begins a second Haiti tour as HH2OT. Herb looks forward to greeting the gang from the DX end again and QSLs can go via W4HYW's K4/W4 ARRL bureau .-.-.- W6LW states, "Just finished building speech and modulator for my kw. — there's a few I can't work on c.w. so I'm forced to try to hook them on A3." He can say that again; M1 3A2 VR6 CR5 PX1 HI CP HC8 ZP and others are much more vulnerable on 'phone these days .-.-.- W8JSU looks back on his W2RDK activity and finds 152 40-meter countries confirmed. To our knowledge only DL7AA lays claim to a higher 7-Mc. tally. W2RDK had 100 countries verified on 40 as early as 1948. Charlie declares ambient W8 noise levels to be far below those encountered in average W2 locations .-.-.- W6EAY wonders how many old-time DX chasers remember 'way back when "VQ1AJ was Fanning Island. . . . YK2XX was the only station on Formosa. . . . China

(*Continued on page 140*)



DL4ZC and XYL DL4ZB call on HA5BB, Budapest, widely worked on c.w. and 'phone. DL4ZC has held eighteen previous call signs and has earned DXCC membership on three continents.

9th V.H.F. Sweepstakes, Jan. 7th-8th

ARRL Certificates to Leaders; Gavel to Top Club

THE Ninth Annual V.H.F. Sweepstakes, open to all amateurs who can work 50 Mc. or higher, will offer wonderful opportunities for new DX records, additional states, and meeting new friends. The contest period starts at 2:00 P.M. your local time, Saturday, January 7th, and continues to midnight, Sunday, January 8th.

Just call "CQ Sweepstakes" on phone or "CQ SS" on c.w. to get in touch with other contestants, then exchange SS data as shown elsewhere in this announcement. This information is similar to a message preamble, with the ARRL section (see page six of this *QST*) substituted for the city and state, and the RS or RST report for the "check."

Make contact with as many stations as possible. (You can rework a station for credit on other v.h.f. bands, so ability to work several bands pays off in score points.) When an exchange of SS "messages" has been completed in both directions, two points may be claimed.

To figure your score, multiply total contact points by the number of different ARRL sections worked. You may use phone, m.c.w., or c.w., with results all contributing toward one score.

Certificate awards will go to V.H.F. Sweepstakes top-scorers in each of the 73 ARRL sections from which entries are received. In addition, a certificate will be given to the top Novice or Technician in each section where *at least three* such licensees submit valid contest logs.

Clubs are urged to get their members on the air from their individual stations to compete for the certificates which go to leading club operators. The club whose members accumulate the top aggregate score will also receive a cocobolo gavel with a sterling-silver band engraved with the name of the winner.

Contest reporting forms are now available from the ARRL Communications Department free upon request. If you don't use these forms, please follow the log arrangement shown. ARRL welcomes all contest reports to assist in cross-checking and to make complete results in *QST* possible. Novices and Technicians: be sure to report your totals, large or small, so that the license-class leader in your section may qualify for a certificate.

Interest in the V.H.F. Sweepstakes has been growing by leaps and bounds. This one will probably be the biggest yet, so why not give your v.h.f. set-up a check? In this one January week end, you'll be able to tell more about how your equipment and antennas are functioning than in months of casual operating. Plan now to take part!

STATION W. . . . — SUMMARY OF V.H.F. SWEEPSTAKES EXCHANGES

Freq. Band (Mc.)	*SENT (1 point)*				*Time . . ST*	*Date (Jan.)*	*RECEIVED (1 point)*				*Time*	*Date (Jan.)*	*Number of Each Different New Section as Worked*	*Points*
	NR	*Stn.*	*CK-RST*	*Section*			*NR*	*Stn.*	*CK-RST*	*Section*				
50	1	W1AW	57	Conn.	4:15 P.M.	7	3	W1PHR	47	Conn.	4:18 P.M.	7	1	2
50	2		43		4:35 P.M.	7	7	W1HDQ	59	Conn.	4:40 P.M.	7	..	2
50	3		58		9:09 P.M.	7	6	W1KCS	359	R. I.	9:11 P.M.	7	2	2
144	4		49		9:30 P.M.	7	32	W1OOP	58	E. Mass.	9:36 P.M.	7	3	2
144	5		57		9:50 P.M.	7	15	WN1EYF	58	Conn.	9:46 P.M.	7	..	2
50	6		54		11:30 P.M.	7	11	W2FHJ	48	N. Y. C.-L. I.	11:32 P.M.	7	4	2
420	7		58		11:35 P.M.	7	30	W1PHR	57	Conn.	11:35 P.M.	7	..	2
144	8		57		11:45 P.M.	7	21	W3TOM	59	Md.-Del.-D. C.	11:56 P.M.	7	5	2
144	..	...	...	...	.....	..	18	W9QKM	59	Ill.	12:34 A.M.	8	6	1
144	9	W1AW	34	Conn.	8:50 A.M.	8	27	W1RFU	59	W. Mass.	8:47 A.M.	8	7	2
50	10		479		9:18 P.M.	8	12	W5NHB	379x	S. Tex.	8:20 P.M.	8	8	2
50	11		589		10:40 P.M.	8	20	VE1QY	569	Maritime	11:35 P.M.	8	9	2

Bands Used: 50, 144 and 420 Mc. 9 Sec., 23 Pts.

Number and names of operators having a share in above work.....
Claimed score: 23 points × 9 sections = 207.

Participating for club award in the.....*(name of club), of which I am a member.*

I hereby state that score and points set forth in the above summary are correct and true.

Tube line-up..... *Signature*.....

Number of QSOs..... *Address*.....

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

Send Like Standard Msg. Preamble	*NR*	*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked	Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Purpose (example)	QSO NR tells how you are doing (NR1)	Identification (W1AW)	RS or RST report (589)	See page six for section list (Conn.)	Time and date must fall in contest period (6:55 P.M. Jan. 7)	

Rules

1) *Eligibility:* Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable *under one call* on or above 50 Mc. are invited to take part.

2) *Object:* Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Periods:* The contest starts at 2:00 P.M. your local time, Saturday, Jan. 7, 1956, and ends at midnight, Sunday, Jan. 8, 1956.

4) *Exchanges:* Contest exchanges, including all data shown in the sample, must be transmitted and receipted for as a basis for each scored point.

5) *Scoring:* (a) Contacts count *one point* when the required exchange information has been received and acknowledged, a *second point* when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the number of different ARRL sections worked (the number in each of which at least one SS point has been credited).

6) *Conditions for Valid Contact Credit:* (a) Repeat contacts on other bands confirmed by completed exchanges of *up to two points per band* may be counted for *each different station* worked. (*Example:* W1HDQ works W1RFU on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only *one* section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

7) *Awards:* Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice or Technician in each ARRL section where *at least three* such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in *QST*.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the *individual contest logs* from such members (resident club members *only*). Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted. Special memberships granted for contest purposes will not be recognized.

8) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting:* Reports must be postmarked no later than January 23, 1956, to be considered for awards.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to faciliate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped-self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — D. W. Waterman, W1IPQ, 99 Flat Rock Rd., Easton, Conn.

W2, K2 — **E. F. HUBERMAN, W2JIL, P. O. Box 62, Station P, Brooklyn 12, New York.**

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Penna.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Robert M. Roden, W5UXY, 5929 Bertha Lane, Ft. Worth, 11, Texas.

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.

W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.

W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.

W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.

VE2 — Harry J. Mabson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.

VE8 — W. L. Geary, VE8AW. Box 534, Whitehorse, Y. T.

VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.

KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.

KL7 — Box 73, Douglas, Alaska.

KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

For several years now it has been no news to v.h.f. men interested in the propagation aspects of their hobby that consistent long-range communication is possible on frequencies higher than the "maximum usable frequency" for normal F_2-layer reflection. We haven't been able to say much about it heretofore, as the essential details have been classified, but that continuous signal on 49.8 Mc. has told its own story for 50-Mc. men as well as we could have done. Since 1951, 6-meter operators over most of the country have known the "Collins Colussus" well.

By 1952 we were able to talk about it in print,[1] but only recently have the principal details of the intensive research programs devoted to the exploitation of tropospheric and ionospheric scattering of v.h.f. waves become fair game for publishers of technical literature. We hope soon to have a comprehensive story for *QST* readers, but in the meantime we urge all of you to look over the October, 1955, issue of *Proceedings of the IRE*. This scatter propagation issue is devoted entirely to papers that summarize the current state of the art of long-range v.h.f. and u.h.f. communication. It is a *must* for any ham who has a serious interest in the future of amateur radio — and that includes the thousands who have never ventured above 29.7 Mc.

At the risk of over-simplification of an admittedly very complex subject, we can summarize by saying that there are two principal means by which v.h.f. and u.h.f. waves travel *consistently* far, far beyond the visual horizon. One mode we're familiar with; we've been exploiting it to some degree ever since we began to use large antennas and low-noise receivers on the frequencies above 50 Mc. It is called tropospheric scattering,[2] and it is observed on all radio frequencies to a degree, but increasingly as we go higher. This is the sort of thing that makes possible the consistent work over distances of up to 500 miles or so that many of the better 2-meter stations now are doing. You can do it on 50 Mc., also, and on our higher bands.

Such scatter communication is not to be confused with "band openings" that make possible work over this and greater distances by tropospheric bending or sporadic-*E* skip. The scatter signals come through all the time. To push them through takes high power, large antennas and good receivers — but they do come through, around the clock and calendar.

The tropospherically-scattered v.h.f. signal hangs on and on far beyond the horizon, and then somewhere in the region beyond 500 miles another type of scatter takes over and extends the range still further. Scattering from the *E* region of the ionosphere, effective at frequencies roughly between 25 and 60 Mc. (with some dependence on solar activity) puts a varying but reliable signal out to distances well beyond 1000 miles. Here again, the signal never fails; it varies over tremendous limits, but it's always there, if you use enough power.

Now what does this all mean to us? For one thing, it means that the frequencies above 30 Mc. have a value for commercial and military use that was never dreamed of until recently. Long-range reliable v.h.f. communication is out of the laboratory. Dozens of our leading electronics firms are pushing for all they're worth to have equipment and antennas on the market for use in this new field. Already the problem of where to put the services who want to go in for it has arisen, and there is no question but that

[1] "New Theories" on V.H.F. Wave Propagation — Technical Topics, April, 1952, *QST*, page 55.

[2] Moore, "Over the Hills and Far Away," Feb., 1951, *QST*, page 13.

♦

One of the real oldtimers on 6 is Arthur E. Ridley, W1DJ, Winthrop, Mass. Art's radio interest spans close to 50 years, and he's been on the v.h.f. bands for more than 20 of them. Mrs. Ridley, W1OIR, shares the operating on 50 Mc. They work all bands from 3.5 to 144 Mc., but 6 is their favorite.

♦

pressure on our v.h.f. and u.h.f. assignments is due to grow by leaps and bounds.

What can we do about it? Certainly it behooves all of us to make more and better use of our slices of the radio-frequency spectrum that lie above 30 Mc. We've done pretty well with 144 Mc. The 50-Mc. activity picture is improving, but it is by no means good enough. 220 and 420 show some life, but we have no more than scratched the surface of their potential. The bands higher lie almost untouched.

One basic reason for setting aside bands for amateur radio is the assumption that we will use them, and in doing so will contribute to the art. We have done this well over the years; nearly all the known means of v.h.f. wave propagation, for example, were discovered and exploited first by hams. But this is no time to rest on our laurels, if any. There are many vague rumblings being heard of changes in the v.h.f. and u.h.f. allocations. To secure the future right of amateur radio to space in this part of the spectrum we need much more and much better use of our present assignments that lie outside the range of what some hams still call an "all-band" transmitter and receiver.

The year end is a time for stock-taking, and planning for the new year. Did you do your part in the promotion of v.h.f. and u.h.f. in 1955? What have you planned for the world above 50 Mc. in 1956? It could be that what you will do on 50 Mc. and higher this year will be the most important work you have ever done for the future of amateur radio.

Here and There on the V.H.F. Bands

One aspect of 50-Mc. DX that has been exploited hardly at all by hams is the possibility of work over distances of 1000 miles or more by ionospheric scattering. One reason for our lack of appreciation of this potentiality of the 6-meter band is that it takes high power and large antennas to make it a reliable matter. The military or commerical user is interested in reliability approaching 100 per cent, but this is unimportant to the ham, in most instances.

The tremendous power used in the Collins 49.8-Mc. experiment, and in the several other long-range v.h.f. scatter circuits now operating, would lead v.h.f. men to think that there was little chance for work by this medium within the legal power limit available to amateurs. The figures are misleading, however, when we realize that the aim of these experiments is to produce a solid readable signal at *all* times. Actually, much of the time a good signal can be put over 1000-mile circuits with less power. If you try for a signal at the peak hours, and under optimum conditions in other respects, it becomes quite possible to communicate on 6 with the kind of gear that a progressive amateur can build.

A one-shot check on 50 Mc. between your conductor and W4HHK, made last summer, produced encouraging evidence. This was with simple 4-element arrays at each end of the 1020-mile path, and a power input of 650 watts at W1HDQ. The next step was a better antenna, which was completed recently. Now tests are being made each week end (see OES Notes), and preliminary results indicate that two-way communication should be possible as soon as W4HHK is able to put on the necessary power.

Over the weekend of Nov. 26th and 27th, six 5-minute c.w. tests were made by W1HDQ. The power input was the same as in the earlier test, but the antenna was a stacked 3-over-3, the bottom bay 60 feet above ground, and ⅝-wave spacing to the top one. The test periods consisted of AØ transmissions interspersed with short calls and signs. At the conclusion of the last transmission on Sunday we sent

50 WAS Mc.

WØZJB	48	W4FNR	39	W8QJN	43
WØBJV	48	W4IUJ	38	W8LPD	42
WØCJS	48	W4BFN	35	W8YLS	41
W5AJG	48				
W9ZHL	48	W5VY	48	W9ZHB	48
W9OCA	48	W5SFW	47	W9QUV	48
W6OB	48	W5GNQ	46	W9HGE	47
WØINI	48	W5ONS	45	W9VZP	47
W1HDQ	48	W5JTI	44	W9RQM	47
W5MJD	48	W5ML	44	W9ALU	47
W2IDZ	48	W5FSC	44	W9QKM	47
W1LLL	48	W5JLY	43	W9UIA	45
WØDZM	48	W5JME	43	W9UNS	45
WØHVW	48	W5VV	42	W9MFH	40
		W5FAL	41		
W1GJO	47	W5HEZ	41		
W1CLS	46	W5HLD	40	WØQIN	47
W1CGY	46	W5FXN	38	WØNFM	47
W1L8N	45	W5LIU	37	WØTKX	47
W1DJ	41	W5NSJ	24	WØKYF	47
W1RFU	41			WØWKB	47
W1FOS	32	W6WNN	48	WØJOT	46
W1WAS	23	W6ANN	45	WØMVG	46
		W6TMI	45	WØTJF	44
W2MEU	47	W6IWS	41	WØURQ	44
W2AMJ	46	W6ABN	35	WØJHS	43
W2BYM	46	W6GCG	35	WØPKD	43
W2RLV	45	W6BWG	33	WØIPI	41
W2FHJ	45			WØORE	37
W2GYV	40	W7HEA	47	WØUSQ	36
W2QVH	38	W7ERA	47	WØVIK	34
W2ZUW	36	W7BQX	47	WØFKY	32
W2ORA	33	W7FDJ	46		
K2AXQ	32	W7DYD	45	VE3AET	44
		W7JRG	44	VE3AIB	35
W3OJU	46	W7ACD	43	VE1QZ	34
W3TIF	42	W7BOC	42	VE1QY	32
W3NKM	41	W7JPA	42	VE3DER	31
W3MQU	41	W7FIV	41	VE1EF	28
W3OTC	40	W7CAM	40	XE1GE	25
W3KMV	39			CO6WW	21
W3RUE	38	W8NSS	46		
W3MXW	38	W8CMS	46		
W3LFC	37	W8NQD	45		
W3FPH	35	W8UZ	45	Calls in **bold face** are holders of special 50-Mc WAS certificates listed in order of award numbers. Others are based on unverified reports.	
		W8RFW	45		
W4FBH	46	W8LPD	44		
W4EQM	44	W8SQU	43		
W4QN	44				
W4FLW	43				
W4CPZ	42				
W4OXC	41				
W4MS	40				

"pse wire results collect." The following message was on the Telefax machine for us at the office Monday morning:

> Six meter tests very successful Signal received major portion of each period with peaks to S9 Positive identification all periods Band conditions normal as indicated by usual level of scatter signal from Collins 49.8
>
> Paul W4HHK

We've always played up the 50-Mc. band as the ideal stamping ground for the low-power enthusiast. It still is that — but it is much more. With 500 watts or more, and antennas of reasonable size at both ends, we should be doing two-way work regularly on 6 over hauls up to at least 1300 miles. Let's get started!

Here's a 2-meter path that has been covered one-way for the first time: W7LHL, Seattle, to W6AJF, Sonoma, Calif., more than 600 miles. Tests have been conducted over this path at intervals since last August, but results in both directions were delayed by a mix-up in schedule frequencies. Now bursts of sufficient duration for identification have been received each way, the signals apparently being of meteor-trail origin. As 600 miles is on the near side for best results via this medium, it would appear that contacts should be possible between W7LHL and the more southerly W6s and W7s.

The equipment at the northern end is equa to the job. W7LHL runs 1 kw. on c.w., and has been using a 96-element collinear array shown on page 55 of August *QST*. Currently, Ernie is experimenting with stacked long-Yagi arrays, in the hope of putting out even more steam. W7UVH. also of Seattle, has two of W7LHL's long Yagis stacked, and results with this array have been very encouraging.

The 2-meter DX schedules kept by CO2CT, Havana, detailed in December *QST*, page 100, have produced no

2-METER STANDINGS

	Call	States	Areas	Miles
	W1RFU	19	7	1150
	W1HDQ	19	6	1020
	W1REZ	18	5	710
	W1UIZ	17	6	680
	W1CCH	17	5	670
	W1IZY	16	6	750
	W1KCS	16	5	600
	W1CLH	16	5	565
	W1IEO	16	5	475
	W1AJR	15	5	600
	W1AZK	14	5	650
	W1MNF	14	5	600
	W1BCN	14	5	650
	W1DJK	13	5	520
	W1MMN	12	5	520
	W2ORI	26	8	1000
	W2NLY	23	7	1050
	W2AZL	21	7	1050
	W2BLV	21	7	1020
	W2UTH	19	7	880
	W2AZP	19	7	650
	W2OPQ	19	6	—
	W2DWJ	19	6	630
	W2AOC	18	6	660
	W2AMJ	17	5	550
	K2CEH	16	7	910
	W2PAU	16	6	740
	W2PCQ	16	5	650
	W2LHI	16	5	550
	K2IEJ	15	5	620
	W2CPT	15	5	625
	W2BRV	15	5	590
	W2FHJ	15	5	435
	W2LBX	15	5	—
	W2DFV	15	5	—
	W3BGT	28	8	740
	W3RUE	25	8	950
	W3KCA	21	7	—
	W3KWL	19	7	740
	W3NKM	19	7	660
	W3IBH	19	7	650
	W3GKP	19	6	800
	W3TDF	19	6	720
	W3BNC	18	7	750
	W3FPH	18	7	—
	W3LNA	16	7	720
	W4HHK	28	9	1280
	W4AO	23	7	950
	W4MKJ	20	8	725
	W4PCT	20	8	—
	W4JFV	18	7	830
	W4VLA	17	7	825
	W4TLV	16	7	1000
	W4UMF	16	6	600
	W4OLK	15	6	720
	W4CLY	15	5	720
	W4ZBU	14	5	800
	W4OXC	14	5	500
	W4JHC	14	5	720
	W4WCB	14	5	740
	W4TCR	14	5	720
	W4UBY	14	5	435
	W4IKZ	13	6	720
	W4JFU	13	5	720
	W4SOP	13	5	680
	W4UDQ	11	5	850
	W4HJQ	11	5	500
	W4WNH	10	5	500
	W4MDA	10	4	680
	W5RCI	21	7	925
	W5JTI	19	7	1000
	W5AJG	13	5	1260
	W5HEH	11	5	850
	W5ABN	11	3	780
	W5QNL	10	5	1400
	W5CVW	10	5	1180
	W5MWW	9	4	570
	W5ML	9	3	700
	W5ERD	8	3	570
	W5FEK	8	2	580
	W5VX	7	4	—
	W5VY	7	3	1200
	W5ONS	7	2	950
	W5FSC	7	2	500
	W6WSQ	5	3	1380
	W6DNG	4	2	350
	W6ZL	3	2	1400
	W6BAZ	3	2	320
	W6NLZ	3	2	360
	W6MMU	3	2	240
	W7VMP	6	4	1280
	W7LEE	5	5	1020
	W7JU	4	2	353
	W7YZU	3	2	240
	W7JUO	3	2	140
	W8WXV	28	8	1200
	W8LPD	25	8	750
	W8RMH	24	8	800
	W8SRW	23	8	850
	W8SFG	23	8	850
	W8SVI	22	8	725
	W8DX	22	7	675
	W8WRN	20	8	670
	W8BAX	20	8	685
	W8JWV	19	8	710
	W8EP	18	7	800
	W8ZCV	17	7	970
	W8RWW	17	7	630
	W8WSE	16	7	800
	W8EGR	16	6	680
	W9EQC	24	8	820
	W9EHX	24	7	725
	W9FVJ	23	8	850
	W9BPV	23	7	1000
	W9KLR	23	7	820
	W9ZHL	23	7	690
	W9WOK	22	8	860
	W9KPS	21	7	660
	W9UCH	21	7	750
	W9MUD	19	7	640
	W9REM	19	6	—
	W9LF	19	6	—
	W9ALU	18	7	800
	W9GAB	18	7	750
	W9JGA	18	6	720
	W9MBI	16	7	660
	W9JIY	15	7	560
	W9BOV	15	6	—
	W9LEE	15	6	780
	W9DSP	15	6	760
	W9DDG	14	6	700
	W9FAN	14	7	680
	W9QKM	14	6	620
	WØEMS	27	8	1175
	WØGUD	25	7	1065
	WØIHD	24	5	870
	WØUOP	18	6	—
	WØONQ	17	6	1000
	WØINI	15	5	800
	WØOAC	14	5	725
	WØTJF	13	4	—
	VE3DIR	26	8	895
	VE3AIB	22	8	890
	VE3DER	15	7	800
	VE3BQN	15	7	790
	VE3BPB	13	6	715
	VE2AOK	12	5	550
	VE3AQG	11	7	800
	VE1QY	11	4	900
	VE7FJ	2	1	365

positive result, but CE3QG, who does the 2-meter operating, is not giving up. He is being heard regularly in the Miami area, but no further, so the next step is a larger array than the present 16-element collinear. Dave would like to hear from any well-equipped 2-meter station in a position to keep schedules. Address, C. D. S. Ternent, c/o Esso Standard Oil S. A., Apartado 4087, Havana, Cuba.

Activity on 144 Mc. is on the increase all through the South. W4KRL, Birmingham, Ala., writes that interest got a big boost as the result of the organization of an emergency and RACES net on 145.35 Mc., a frequency that is monitored almost constantly now in the Birmingham area. The success of this net has triggered off similar projects for other parts of the state, and a statewide 2-meter net appears a good prospect.

W4SOP, Burlington, N. C., says that his state is "one of the most active on 2 outside of Yankeeland," and interest in 50 and 420 is not lacking, either. Most of the gang started with the usual low-powered surplus rigs and Communicators, but most of the home stations are going to higher power, better receivers and larger antennas. *A leader in the* move to 144 Mc. has been W4CVQ, Raleigh, with his high power and large collinear array, and quite a few old-timers have joined in. Regularly heard are W4s YSB YLU MRH MXF and K4AMX, all in Winston-Salen, W4TLA, Rocky *Mount*, W4MDA, Wilmington, W4SMA, Whiteville, and many others are on at random times. Contacts up to 200 miles or so, such as W4SOP to W4MDA, have become commonplace, and most of the gang have worked their share of DX. W4CPZ, Gaffney, S. C., 144.35, has provided one more state in the continuous chain down the Atlantic Seaboard. W4SOP suggests that fellows looking for Carolina stations watch 144.45 for the North Carolina Ragchew Net (DX men spying on each other!) nightly.

The appearance of Channel 2 in Buffalo has not prevented the development of 6-meter activity in Western New York, according to K2HRB, Lancaster, N. Y. A calling frequency of 50.1 Mc. is in use, with K2s IAX IWZ ORO ORM JBY HRB and W2VLL among those active recently. A surprise opening to W4 and W5 was caught on Oct. 26th.

W9KLR, Rensselaer, Ind., has a suggestion about the 2-meter states-worked listing. Bill feels that we should give a bold-face listing to the operators who submit QSL card proof of their claims. Anyone else like this idea? And on the subject of those boxes, we still need more listings for 220 and 420 before we can start a box for them. If you want to see records for 220 and 420, send us yours.

Things are happening on those bands. W9EQC, Aurora, Ill., has worked W8SVI, Fairborn, and W8IJG, West Richfield, Ohio, several times on 220. Dick has a pair of 4X150As about ready to go on 220, and should be running a high-efficiency 500-watt input there soon. W2DWJ, Elizabeth, N. J., is on 432 Mc. Tuesdays and Thursdays from 2130 to 2300, working with K2DZM, Rahway, W2BQK, Bergenfield, and W2WDF and W2AOD over on Long Island.

W4VVE, Phoebus, Va., reports that our plug of his 420-Mc. work in November *QST* brought him a schedule with W3ARW. A tropospheric opening October 28th netted a crossband contact, 144-432, with W2BLV, Haddonfield, N. J., and two-way work with W2AOD and W3GGR. Chick suggests that fellows who have 420-Mc. gear put it on the air at a specified time each evening when they are at home. He offers 2200 nightly as 432-Mc. schedule time for interested parties.

In November *QST* we asked if the c.w. contacts made on 1296 Mc. by W6MMU and W6DQJ were the first use of keyed c.w. on that band. This brought a fine letter from F3SK, secretary of the V.H.F. Commission of the REF, our IARU affiliate society in France. He reports that on April 30th he and F8OL worked two-way on 1260-Mc. c.w. F8OL was using a 2C39 tripler, delivering about 5 watts output on 1260 Mc. feeding a horn antenna with a gain of about 16 db. The receiver was a crystal-mixer, a crystal-controlled second conversion from 145 to 15 Mc., working into an HRO.

F3SK used a 4X150A tripler to 420, driven hard so that it had 1260-Mc. output. The antenna was fed with a waveguide that passed the 1260-Mc. energy, rejecting the 420-Mc. power in the plate circuit of the tripler. The receiver was quite similar to F8OL's, but with the last i.f. at 24 to 30 Mc. in a home-built receiver. The distance was 8 miles.

On Sept. 28th, F8OL worked crossband, 1260 to 145 Mc., with F8GH, a distance of 50 miles, and later over a distance of 85 miles, the latter far beyond the visual horizon.

F3SK also brings to our attention a two-way contact between F9BG, Toulon, and FA8IH, Algiers, on 432 Mc., made July 26th, 1954. FA8IH has also worked F8KY in Marseilles. Both appear to be well over the W1RFU-W4VVE 410-mile record, and should be recognized as world marks. Word was sent of this work at the time, but the letter was never received here at ARRL-IARU Headquarters. Our belated, but none-the-less sincere congratulations to all hands!

About Those V.H.F. Calling Frequencies

In August *QST*, page 57, we dropped a hint regarding national calling frequencies for 50 and 144 Mc. This came about as the result of suggestions received from time to time that specific frequencies for calling be set aside in the v.h.f. portion of the spectrum, as they are in our lower

(*Continued on page 144*)

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

KZ5LM

W6FEA

YLRL Chairman for the Canal Zone (left), is KZ5LM, Lois Magner (Box 373, Margarita). Licensed in 1949, Lois works 15 meters and has an A-1 Operator's certificate. She and her OM, KZ5NM, are MARS members, and her stateside call is W4UPJ. Gertrude Cassady, W6FEA, of San Rafael (right), current chairman of the sixth district for the YLRL held the same office in 1951. The XYL of W6WJF, Gertie is vice-president of the American Legion Amateur Radio Net.

AFT and FORE

The first of a new year is a popular time for looking back and for looking ahead. Let's indulge a bit in the sport, too.

What happened in YL hamdom in 1955? Foremost, we grew in numbers, with the majority of newcomers holding Novice class licenses. (We'd like to insert some figures here, but even in radio circles feminine statistics are illusive.) Concurrently, we think there was an increase in YL activity in general. It's unusual to tune across a band and not hear feminine voices; fists too, of course, but they are not so easily recognized. YLs were getting younger and they were getting older, from seven to seventy-five and all in between. New YL clubs materialized in each of the call areas. In April and May we listed some fifteen existing clubs; by December ten new ones had been organized. In June the Young Ladies Radio League made history by sponsoring its first national convention. The affair set a precedent for other YL conventions that are sure to follow. Interest zoomed in the various YL certificates, with OM enthusiasm flatteringly conspicuous. To date the only three WAC/YL certificates issued have gone to OMs W2QHH, ZL1BY, and G4ZU. Of seven WAS/YL certificates issued, four have gone to OMs; and one seems to bump into almost as many OMs hunting contacts for the YLCC as YLs themselves. Meetings, net picnics, banquets, get-togethers were more numerous — (the number of group photographs received for this department was up about 200% over the previous years.) YL calls continued to appear in the Brass Pounders' League each month, with veteran BPL member W3CUL leading all other amateurs in traffic totals for four of the past eleven months. W2sKEB and RUF and W9JUJ each made the League seven times in the months January through November. Several more YLs received DXCC certificates last year, and many others moved closer to the one hundred mark. And on the story could go. The past twelve issues of this department record in detail some of the doings and the trend of things in the YL world in 1955.

More important now is 1956. If we could make just one recommendation for the coming year, it would be simply to urge you to take time *each* day from your busy schedule and reserve it for hamming only. Here is a suggestion for "making" time for a brief period of ragchewing, building, DXing, studying, or whatever you prefer. An anonymous contributor to the woman's page of a New England newspaper has won renown for suggesting that housewives allot twenty minutes a day for tackling one household project above and beyond what is normally done in the course of a day. Enthusiastic homemakers accomplish tasks they would not ordinarily get to do by merely "taking" their twenty minutes

(*Continued on page 140*)

* YL Editor, *QST*. Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

◆

Fifteen of the 17 YLs who attended the ARRL Central Division Convention at South Bend, Indiana, are pictured here. Left to right, front row, W9s WYZ, RTH, AQB, CNW, MLE, and LGR. Back row, W9RUJ, WN9MAS, W9s IDJ, LOY, MMO, W8FPT, W9s IKD, YWH, and SJR. YLRL President W9LOY was introduced at the banquet preceding a speech by General Manager Budlong. Getting the edge on the OMs, W9s MMO, RUJ, and WØRTH copped three of the five prizes offered for solving technical problems.

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coördinator
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

The New Year. Happy New Year . . . and may we cordially invite all amateurs to take part in any and all operating activities that the League has scheduled for 1956. The individual communicating ability of both operator and station are tested *and advanced* through station tests. Read our activities announcements elsewhere in *QST* (also see advance dope in the Activities Calendar box) and don't let the chances at progress and operating enjoyment pass you by.

A listing of the SCM-appointments that can give you recognition and a constructive place in operating organization was presented in these columns last month, and we suggest that you review that information. Get your SCM to identify you with the section ARRL program, and don't overlook the AREC/RACES and emergency radio preparedness.

The Novice Round-up as well as the V.H.F. Sweepstakes are highlights soon coming up that give point to those special kinds of work. The ARRL International DX Competition in February and March should see our DX bands busier than ever in history. While not yet back at the top of the sunspot cycle, the 28-, 21- and 14-Mc. bands are already reflecting the looked-forward-to improvement in DX conditions. Try them out! Make it the best year ever in amateur radio.

Voluntary CONELRAD, What Does it Mean? How do we operate for full observance? The fact that FCC is asking us voluntarily to follow the CONELRAD-for-amateurs plan as has been detailed editorially and is spelled out (on the technical side) elsewhere in this issue is a reflection of the continuing world tensions; also of FCC's confidence that we can and will comply to the full. While *voluntary* CONELRAD means that we have an adjustment period, compulsory CONELRAD could be required overnight. The aim of CONELRAD (for all services) is of course to nullify or minimize the navigational information that could be afforded enemy air craft by operation of our radio stations.

The CONELRAD rules for our service approved by FCC on November 30th are in any event to be effective in one year, on Jan. 2, 1957 . . . or on such earlier date as FCC by order may designate. Under these rules we must in any operating period keep track of what is going on in the broadcast band. This is to alert ourselves and check whether or not we can have a signal on the air. The alerting requirement can be met if you and I check a broadcast station *once each ten minutes* to see if it is operating in the normal way; this need be done only during a QSO or just before the transmitter is put on the air. Whether a CONELRAD Alert is in force can be determined by an absence from the air of b.c. stations on their normal frequencies; also by positive reception of standard broadcast stations proceeding under CONELRAD requirements on 640 or 1240 kc.

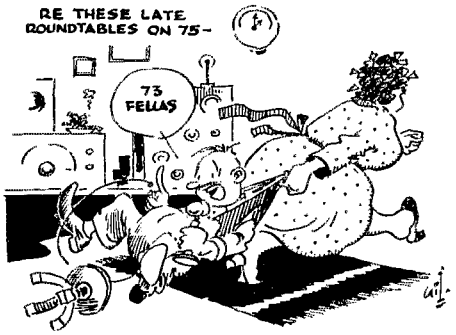
During a CONELRAD Alert operation of all amateur radio stations, except those specifically authorized, as in RACES or otherwise, will be discontinued until the CONELRAD RADIO ALL CLEAR is issued.

Compliance isn't difficult. Read the up-front article and take your choice of the methods shown. And there are other schemes (you tell us) that will do the trick.

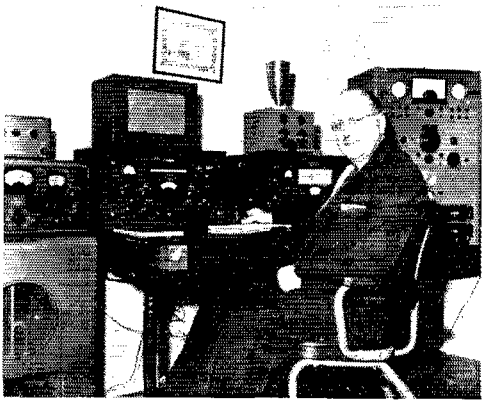
More FCC Suspensions. A number of different FCC actions have already been reported in March, July, October and December, 1955, *QST*s. To those now add the following:

FCC ordered (26 Oct., 1955) that the General Class operator license of James C. Harpham, jr., K6HAN, Pasadena, Calif., be suspended for a period of *six months*. This is under authority of Sec. 303(m)(1)(D) of the Communications Act of 1934, as amended, and Sec. 0.292(f) of the Commission's Rules. This action is taken, *it appearing that* said licensee on Aug. 22, 1955, while engaged in operation of his amateur station, transmitted a call sign *not assigned by proper authority to the station he was operating*, a violation of Sec. 12.158 of the FCC rules.

FCC ordered (26 Oct., 1955) that the General Class amateur operator license of Herbert E. Koch, Pasadena, Calif., be suspended for a period of *one year*. This is under authority of Sec. 303(m)(1)(A) of the Communications Act of 1934, as amended, and Sec. 0.292(f) of the FCC rules. FCC moved for suspension in this case, *it appearing that* the licensee on Aug. 22, 1955 (1) transmitted communications containing obscene, indecent or profane words, language or meaning in violation of Sec. 12.157, (2) that on the same date he trans-



— Idea Courtesy WBKVK



It's no accident that the FMT measurements of these ARRL Official Observers are right on the button! *Left:* Bill Marshall, WØOTR, of Denver, Colo., has his frequency measuring gear in the rack next to the KW-1. The top panel allows switching of all equipment to the 'scope. Under this is a harmonic amplifier and 50- and 5-kc. multivibrators. The National PW dial identifies the RC audio oscillator, output 50 through 2500 c.p.s. The BC-221 is a convenience to use with uncalibrated receivers. Lower panel spaces contain the 100-kc. rock and multivibrators to calibrate the audio oscillator each 50 c.p.s. The oscillator is a 100-kc. crystal in an aluminum oven with half-inch walls. The heater and sensing element are the same differential bridge operated by an audio oscillator, where input is cut off by the bridge when proper temperature is reached. Adjustment once a week keeps frequency at less than .00000001 deviation from WWV; a 20-second cycle-counting period is required to achieve this comparison . – . – . – *Right:* G. Donald Fenton, W1MUN, Worcester, Mass., keeps his measuring equipment in the cabinet at the right. The top panel contains two 'scopes and a 12-400 c.p.s. RC oscillator. In the second panel are a multicrystal tunable standard, multivibrator and harmonic amplifier. Provision is made for 19 different crystal standards including 100 kc., all of which can beat against WWV or the 100-kc. temperature-controlled standard at 5 Mc. Other panels contain the 100-kc. standard, a 'scope and fixed-frequency CW-3 receivers on 5 and 2.5 Mc. Don's FMT procedure is as follows: Approximate frequency of the unknown is first determined to nearest 100 c.p.s. in the 75A-3 with aid of 100-kc. standard and multivibrator. Tabulated data on all crystals shows proper crystal and submultiple to most closely approach the unknown and a switch is made to that position. It is usually possible to zero on the unknown and WWV and thereby "freeze" data on the unknown. Two 'scopes, one connected to the receiver tuning the unknown, the other connected to the receiver on WWV or standard, indicate frequency differences read from the dial of the RC oscillator as a function of time.

mitted a call sign *not* assigned by proper authority to the station he was operating, a violation of Sec. 12.158, (3) that said licensee transmitted music in violation of Sec. 12.104, and (4) that he operated his amateur radio station on 7400 kc., a violation of Sec. 12.111.

Are Our QSLs Adequate? What Do They Spell Out? The subject of the acknowledgment card is of considerable importance to a large number of amateurs. Its design, the desirable requirement for space for authenticating signature and what it needs to constitute proof for WAS or DXCC could bear emphasis. The time, the date, the frequency, the mode and the city or location in specific terms should be recorded on one's QSL, if it is to "do the mostest for the mostest."

The following remarks by Jim Hiatt, K4DAP, also stress the personal and fraternal values which should never be overlooked. Jim makes his subject "Happy QSLs." "I am one who trys to QSL one hundred per cent and I like to receive as many as I can in return. It's not always the card but the 'something extra' that gives me pleasure in receiving a card. Of course when I get a card I look for the date, time, band and signal report. It *can* have these and be just another QSL; however, if it describes the sender's rig and has a little message on it, it makes me seem to know the sender personally and enjoy the card much more. A 'tnx much for vy FB QSO and wish u best DX, Jim' or 'hope to be hearing u on vy much in the future' gives me a warm feeling and makes me want to extend my contacts with the writer. So I always try to add that little extra message. Whether a DX station or a close-by fellow worker, this is truly appreciated. I think everyone likes *something extra.* Don't you?"

—*F.E.H.*

SEPTEMBER FMT RESULTS

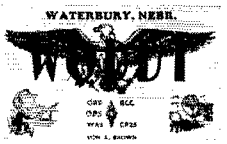
ARRL's Frequency Measuring Test held September 15, 1955, brought 886 measurements from 193 participants, each of whom has already received a report comparing the accuracy of his measurements of the W1AW transmissions with those of a professional frequency-measuring lab. In the standings of the leaders below, decimal fractions are shown only to establish an order of listing, inasmuch as the readings of the "umpire" can only be accredited to 0.4 parts per million. Therefore W1MUN, W4JUI, WØOTR, W8CUJ, W8HB, W8GQ, W8YCP, and W4HER equally share top honors.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W1MUN	0.0	W8HB	0.1
W4JUI	0.0	W8GQ	0.2
WØOTR	0.0	W8YCP	0.2
W8CUJ	0.2	W4HER	0.4
W2FE	0.5	TF3CJ	0.7
W8GBF	0.6	W6CIS	0.8
W9CBW	0.7	W1TWJ	2.1
W4IU	1.8	W3PYW	3.3
W3QZP	2.5	W4ANK	3.3
W4FR	2.9	W3AHZ	6.1
W7PQJ	3.3	W6EVC	6.8
W8GZ	3.7	W6AXV	7.0
W9ERU	5.0	W2VCX	7.9
W6CBO	5.4	W8HPR	8.0
W2AIQ	6.1	G6PF	8.1

The following rating is based on a single measurement: *Non-QQ* — W3QJJ 1.1.

BRIEFS

One evening last fall, Von A. Brown, WØDDT, raised W1AW on 80 c.w. and took traffic for relay to the Pacific Area Net. Afterwards Von dropped a QSL off to the ARRL



Headquarters station. Nothing unusual about that, you say? Well, WØDDT's card, which arrived October 25th, was the *10,000th* QSL received postwar at W1AW!

—•••—

The West Suburban Emergency Radio Net has conducted a number of hidden transmitter hunts, but the ending to one held in September was unique! Member W9OKI mobiled to an abandoned quarry near McCook, Ill., and began making brief transmissions so that his loop-equipped pursuers could get their bearings. Noticing a "stripped" auto, he passed the license number to W9GPV, who advised local police. The car turned out to be stolen and police quickly converged on the area to begin their investigation. West Suburban's game was spoiled this time, but they were happy to make this contribution to law and order.

—•••—

Attention, all amateurs sending code practice! If you haven't already filed your code-practice schedule information with ARRL, why not do so before April, 1956, so that an up-to-date listing may appear in *QST*. ARRL now has on hand convenient code-practice information cards available upon request. Got yours?

RTTY CONVENTION

The *esprit de corps* of the RTTY gang runs mighty high, reports W9BGC. For instance, during an October convention in Chicago over 50 RTTY operators and prospective operators from seven call areas were present. Of this group, 43 had teleprinters of one kind or another and more than eleven of those had two or more teleprinters or auxiliary equipment. In publicizing this event (with just four-weeks notice) about 90 letters were mailed, all typed on page printers, and returns were better than 50 per cent.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on January 17th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on January 7th at 2100 PST on 3590 and 7128 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW nightly at 2130 EST. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in unison with W1AW.

Date	Subject of Practice Text from November *QST*
Jan. 3rd:	*A High-Powered Tetrode Rig*. . . . , p. 11
Jan. 10th:	*Single Sideband with the BC-610*, p. 21
Jan. 12th:	*A Super-Selective Converter*, p. 22
Jan. 16th:	*Budget 7-Mc. Vertical Antenna*, p. 26
Jan. 18th:	*A Pair of 45s in Push-Pull*, p. 30
Jan. 23rd:	*A Transistorized Control Unit*, p. 32
Jan. 26th:	*Using the Voltage Doubler*, p. 34
Jan. 31st:	*Contacts vs. Multipliers*, p. 46

A.R.R.L. ACTIVITIES CALENDAR

Jan. 7th: CP Qualifying Run — W6OWP
Jan. 7th–8th: V.H.F. Sweepstakes
Jan. 14th–15th: CD QSO Party (c.w.)
Jan. 17th: CP Qualifying Run — W1AW
Jan. 21st–22nd: CD QSO Party (phone)
Feb. 3rd: CP Qualifying Run — W6OWP
Feb. 4th–19th: Novice Round-up
Feb. 10th–12th: DX Competition (phone)
Feb. 14th: Frequency Measuring Test
Feb. 15th: CP Qualifying Run — W1AW
Feb. 24th–26th: DX Competition (c.w.)
Mar. 3rd: CP Qualifying Run — W6OWP
Mar. 9th–11th: DX Competition (phone)
Mar. 15th: CP Qualifying Run — W1AW
Mar. 23rd–25th: DX Competition (c.w.)
Apr. 6th: CP Qualifying Run — W6OWP
Apr. 13th: CP Qualifying Run — W1AW
Apr. 14th–15th: CD QSO Party (c.w.)
Apr. 21st–22nd: CD QSO Party (phone)
May 5th: CP Qualifying Run — W6OWP
May 14th: CP Qualifying Run — W1AW

OCTOBER CD PARTIES

ARRL appointees and officials just about unanimously acclaimed the c.w. session of the October party the peppiest ever held. It's going to take some doing to approach W4KFC's incredible QSO total in the future. Altogether *20* tallies above 100,000 were turned in from all U.S.A. licensing areas, and *18* stations contacted 60 or more sections, W4KVX leading in the latter department with 65. . . . On phone, Idahoan W7RSP, working 75 and 15 meters only, became the first W7 to lead the microphone competition. Activity and interest are growing here, too; there were 18 totals of 10,000 points or more.

C. W.

W4KFC	229,005	720–63
W4KVX	177,450	546–65
W6BIP	158,968	281–62
W4PNK	154,690	499–62
W3VOS	143,045	464–61
W1RAN/4	133,920	426–62
W5DWT	129,010	416–61
W1JYH	128,405	414–61
W7BSU	117,464	217–59
W9WWT	110,100	360–60
K6BWD	109,480	215–56
WØPHR	107,665	353–61
WØRDN	106,785	339–63
W8LHV	106,445	342–61
W7VIU	105,328	199–58
W7JLU	105,280	205–56
W3KUN	102,900	389–52
W2FEB	102,080	352–58
W9KLD	100,955	327–61
W2DGW	100,035	351–57
W2AEE	99,120	336–59
W9NH	97,500	319–60
W4BZE	93,240	328–56
K2DSW	92,675	331–55
K6GUZ	91,854	189–54
W3GJY	91,155	302–59
W3TMZ	90,895	343–53
W8TZO	86,900	309–55
W2ZVW	84,680	285–58
W9GDI	83,810	289–58
W6CHV	83,268	168–54
W6CRT	82,940	155–58
WØDW	82,800	276–60
W1UGW	82,150	305–53
W3JNQ	81,120	333–48
WØPDN	80,520	257–61
W8YDR	78,600	262–60
VE2DR	77,235	265–57
W6NJU	76,755	165–51
VE6NX	75,600	168–50
W9FGX	75,300	245–60
W4WQT	73,975	264–55
K2AFQ	72,675	279–51
W4TFX	68,115	234–57
VE7AC	67,756	142–52
W4LVV	66,120	225–57
K2EDH	65,800	229–56
W9YZA	65,520	246–52
W1FZ	65,340	237–54
WØIA	62,540	205–59
K6ASX	62,169	178–53
WØEEE[1]	61,480	227–53
K2EQD	60,950	224–53
W6UTV	60,840	130–52
VE3EAM	60,525	225–53
W9SDK	60,225	212–55
W1NXX	58,740	260–44
W4LK	58,590	217–54
W2AZS	58,520	209–56
K2CPR	57,420	191–58
W1HUM	56,750	220–50
W1ARR	55,680	226–48
K2HID/6	55,539	121–51
W2DRV	54,315	208–51
W7FRU	54,194	119–49
W3SLI	53,900	214–49
VE2CP	53,110	219–47
W3ZAL	52,800	192–55
VE3BXF	52,430	210–49
W3AXA	51,680	267–38
W4JUJ	51,510	195–51
W8DAE	51,495	210–47
W3EIS	50,680	175–56
W5MRK	50,680	176–55
W9DIK	50,000	195–50

PHONE

W7RSP	19,836	58–38
W2AEE	18,725	107–35
W8NOH	17,655	102–33
W2ZVW	17,490	99–33
W2VCZ	16,497	80–39
W8NYH	15,225	87–35
W1FZ	14,125	108–25
W3BNR	13,485	93–29
W4NYN	13,440	84–32
K2DSW	13,000	98–25
W1YBH	12,840	104–24
W1AW[2]	12,480	89–26
W4FV	12,330	74–30
W3EAN	11,310	82–26
W8YDR	11,220	68–34
W4JUJ	10,800	83–24
W2EEN	10,440	83–24
W1YYW	10,370	61–34
W1WEF	9410	71–19
W8ZXC	7695	53–29
K6BWD	7568	36–22
W2VDT	7260	61–22
W1UGW	7080	54–24
W1DYE	5775	48–25
VE2CP	5700	50–20
W1UTA	5610	60–17
K6BAM	5400	30–20

[1] WØs BZK WFF, oprs. [2] W1WPR, opr.

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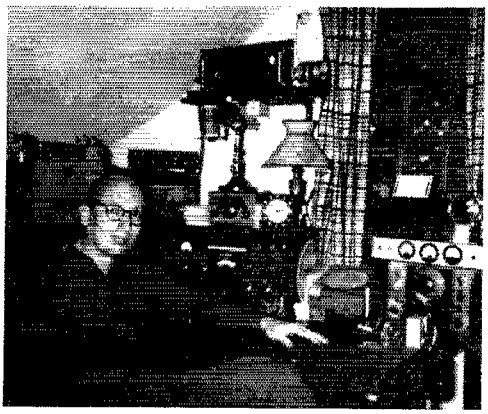
In 1935 a young lad named Vic Clark took his first crack at an ARRL activity known as the ORS Party and had a jolly old time. The next year he won the Maxim Memorial

Award. He was W6KFC of Arizona in those days. Now the ORS Party is the CD Party and Vic is W4KFC. And in the ten years he's signed that call it's become one of the most famed in Hamdom. In October '55, on hand for his *59th* c.w. CD Party, Vic ran up a new all-time record of 720 QSOs. Setting records and amassing mammoth contest totals is, of course, "old hat" at W4KFC. We can't mention them all without publishing 13 *QSTs* this year, but here are a few recent achievements: second-high U. S. A. brasspounder in '55 ARRL DX Competition; third-high c.w. scorer in '54 Sweepstakes; paired up with W3EIS/3 to pace Class B entrants in '55 Field Day; holder of most-QSOs-in-SS title (1183 stations in '53).

Contests are just one of his interests. Vic also sports 201 DXCC items confirmed, is an ex-SCM, sparks Potomac Valley Radio Club affairs, checks into the Virginia Net, travels anywhere to attend Hamfests and Conventions, holds appointments as Asst. Director, EC for Annandale, and ORS.

In the photo, portions of the kw. transmitter (which grabs S9 on all bands 160 through 10) are visible at the left.



Also in evidence: 75A-2 and NC-100 receivers and a DB-23. Perched atop the NC job is a little rig especially designed for the '55 SS.

His favorite on-the-air event — bar none — is the quarterly CD Party. In these words, Vic tells why: "The reasons for this preference become evident to all who have taken part in any of these sessions. The parties offer a competitive incentive to excel without sacrificing fraternal advantages — a snappy pace, but always time to enjoy a chat with an old friend. . . . Only Hollywood superlatives could do justice to the October Party. The turnout was colossal and conditions superb on all bands! A privilege to spend the week end with such a fine bunch of ops." Aye, verily and forsooth!

TRAFFIC TOPICS

At the Midwest Division Convention in Omaha, October 22-23, it was necessary to break up the traffic meeting rather abruptly in order to make the banquet. A good many traffic questions which had previously been posed were thus left unanswered. Since most of them were of a general nature and to be answered by your ARRL representative on traffic matters, suppose we attempt to answer some of them this month.

Question No. 1. What is the overall policy regarding direct liaison between section nets instead of working through regional nets? *Answer:* If you don't use the system set up, it will die. "Hustle-shuttle" liaison between section nets is very efficient, but not very practical. Any other kind of liaison has no advantage over working through the regional net. However, we do not disapprove of direct liaison provided it has the approval and acquiescence of *both* net managers concerned, and provided it does not take the place of representation of the section in the regional net.

Question No. 2. Why doesn't ARRL eliminate the BPL and BPL medallion as not being good for our organizational efforts along traffic lines? *Answer:* Tradition dies hard. Elimination of the BPL would, we happen to know, be extremely unpopular among the majority of traffic men, especially the old timers with whom it is a dear tradition. Besides, the element of individual rivalry and competition is a "must" for the success and popularity of any organizational venture — see your psychologist for the reasons. As for the BPL medallion, this is a creation of your Board of Directors, by a vote of 14 to 2 (1954 meeting). What the Board has created, only the Board can rescind.

Question No. 3. How does one count traffic in a two-station family, where the same equipment is used by two people under different calls? *Answer:* The same as if they were two entirely separate stations. The *call* used determines which station gets the credit, regardless of who is doing the operating. Separate message files should be kept if different calls are used. Traffic passed from one call to the other between receipt and transmission should not be credited as "relayed," since no on-the-air activity is involved. We call such traffic "transferred," and this act, unlike "delivery," does not receive a message credit.

Question No. 4. How does the Transcontinental Corps work? *Answer:* Sometimes good, sometimes not so good. A little too lengthy to go into here. Briefly, the TCC is a means for relaying traffic between NTS Area Nets, mostly by means of out-of-net schedules. This works out better than direct liaison between area nets because stations carrying traffic can pick the most favorable band and, with certain restrictions if efficiency is desired, time of day.

Question No. 5. What are the chances of organizing some NTS regional net sessions on phone? *Answer:* See your regional net manager. NTS doesn't have separate phone and c.w. organizations. It's all one system; we should select the mode to suit the need.

Question No. 6. Why isn't the "book" message used more? *Answer:* We think there are two principal reasons. First, traffic men don't feel they get enough traffic points when they use it. Second, many of them don't know *how* to use it, despite the fact that a lengthy explanation of its use has appeared in *Operating an Amateur Radio Station* for lo these many years. To the former, we say that it is up to you to decide which is more important, prompt and efficient traffic handling or your point score. To the latter, we summarize *how* to send the book message by saying you begin by transmitting first all the things that are the same in each message of the book, then transmitting each message number followed by the things that are different. It counts as *one* message when sent or received in that form, although the receiving station may have to separate its parts into separate messages when he relays them onward or delivers them — in which case he gets separate points for relaying or delivering, as the case may be. Complicated? Not at all. Quite logical, if you *think* about it.

Question No. 7. What is the feasibility of checking into phone nets on c.w.? *Answer:* It's pretty risky, as a rule. It makes the phone men mad. In an emergency, it would be okay, but as a general procedure, we think it would be most unpopular. As an NTS policy, it's very questionable.

We have offered before to answer general traffic questions in this column. We do so again. If your question is not one which would be of interest to all, we'll answer it by letter. If it's broad enough to be applicable to everybody, we'll answer it both by letter and in this column. So let's have 'em if you've got 'em.

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The Transcontinental Phone Net, First Call Area, registered 512 message counts with 17 stations participating in September; Second Call Area reported 495 message counts by 8 stations. In October, TCPN First Call Area registered 631 messages by 16 stations, Second Call Area 733 by 14 stations.

Early Bird Traffic Net count for October was 450.

North Texas-Oklahoma Net reports 31 sessions, 259 messages, 829 check-ins in October.

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National Traffic System. In the tabulation below, there continues to be some confusion regarding the significance or meaning of the "Rate" and "Representation" columns. The "Rate" is the rate at which traffic was handled during the net's busiest session; or, to be more specific, the messages-per-minute handled during the "high traffic" session of the month. "Representation" signifies the percentage of representation by sections in regional nets, or the percentage of representation by regions in area nets, as the

case may be. If all sections are represented in every regional net sessions, for example, the representation is 100%. Whenever a section is not represented (presumably but not necessarily by a regular liaison station from the section net), representation falls below 100%.

Okay now?

October reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	26	383	0.43	14.7	91.2
2RN	26	333	0.64	12.8	93.6
3RN	42	319	0.41	7.6	68.3
4RN	20	65	0.15	3.3	69.0
RN5	44	563	0.70	12.8	73.0
RN6	44*	218	——	4.7	56.8
8RN	39	128	——	3.3	79.5
9RN	26	512	0.42	19.7	97.1
TEN	67	1496	——	22.3	68.8
TRN	28	50	0.40	1.8	67.9
EAN	17	723		42.5	95.0
CAN	24	892	0.80	37.2	——
PAN	21	411	0.46	19.6	——
Sections **	398	2432	——	6.1	——
TCC (Eastern)		230			
TCC (Central)		684			
TCC (Pacific)		389			
Summary	822	9446	CAN	2.9	
Record	822	9446	0.80	12.3	

* Out of 51 sessions held

** Section nets reporting: NTX (N. Texas); AENB, AENP & AENT (Ala.); CN & MCN (Conn.); GSN (Ga.); MSN (Minn.); WVN (W. Va.); Tenn. CW; *High Noon (Colo.)*; QKS, QKS SS & QKN (Kans.); TLCN (Iowa); KYN (Ky.).

As far as "Representation" goes, the percentage figure shown reflects not so much on the regional net as on the section nets in that region. It is a function of section representation at regional level (or regional net representation at area level, in the case of an area net) and varies in direct proportion to the reliability of that representation. In this connection, WØNIY has pointed out that percentage is not such a good criterion of excellence when a regional net conducts only one session nightly; for instance, is 100% liaison in such a case necessarily "better" than 90% liaison in the case of a regional net which conducts *two* sessions nightly, in accordance with the NTS standard? We think he has a point, and for that reason, for the time being at least, suggest that high percentages shown be taken with a grain of salt unless the regional net concerned is observing full NTS schedule. If such were the case, maybe their percentages would be just as high, but then again maybe they wouldn't.

Section nets: new NTS section net reporting forms are now available, taking the place of CD-89, which is now used only for regional and area nets. If you want to report your section net activity to be included in the above, drop us a line requesting a supply of CD-125.

Conn., Maine and W. Mass. were represented 100% on 1RN in October. K2LSF, W2RUF and W2BXP deserve special credit for their work on 2RN, and have received 2RN certificates. W3NRE reports that 3RN will operate two sessions, at 1830 and 1945, during the winter season. A big improvement was noticed on 4RN, with W4SHJ deserving special mention; North Carolina is still down. W4OGG reports the best section representation of the year in RN5, with Southern Texas beginning to show signs of life. RN6 certificates have been issued to W6BPT, W6VZT and K6GZ; manager W6ZRJ is proud of his net's seven-night-a-week two-session-per-night status. Many outside stations QNI 9RN, sez manager W4KKW. TEN Manager WØDQL asks for better representation from Manitoba and indicated his intention to relinquish the managership reins at the end of 1955. VE3GI would like to have better NCS reporting on TRN. CAN is going strong, now under the managership of W9DO. Lack of PAN reports are the result of no NCS reports to the net manager, W7APF tells us.

Transcontinental Corps: Present roster includes (Eastern Area) W1AW, W1EMG, W1NJM, W2ZRC, W3COK, W4OCG, W8DSX (SG), W8FYO, WØBDR, VE3AJR, VE3VZ; (Central Area) WØBDR and WØSCA; (Pacific Area) W6ADB, W6QPY, W6ORT, W6IPW, W6BPT, W6VZT, K6BDF/7, W7CCL, W7KZ, WØKQD, KØWBB. TCC Directors are W8UPB (Eastern Area), WØSCA (Central Area) and WØKQD (Pacific Area).

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for October traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
WØSCA	20	549	508	12	1089
WØBDR	142	486	438	7	1073
W9DO	35	497	475	57	1064
W2KFV	32	585	400	35	1052
W2KEB	50	466	375	151	1042
WØCPI	7	496	449	47	999
W7BA	22	468	436	30	956
W7PGY	24	397	338	57	816
K6HOV	2	380	370	10	762
WØPZO	4	372	369	4	749
W4PFC	4	375	360	5	744
W3CUL	77	323	258	56	714
W9TT	8	296	225	3	532
W3YYC	70	192	230	21	513
W9NZZ	148	181	0	181	510
W7VAZ	7	248	211	36	502

More-Than-One-Operator Stations

W6IAB	19	1367	1261	106	2753
KH6AJF	285	830	779	55	1949
WØWBB	118	418	360	32	928
W1USA	32	433	405	30	900
K4WAR	39	391	320	70	820

BPL for 100 or more *originations-plus deliveries:*

WØRDN	210	W9DDK	110	KP6AK	101
WØPNA	196	W9DGA	110		
K2LSF	146	W7AHV	109		
W3CVE	146	W7WOK	108	Late Reports:	
W4DDY	134	WØNIY	104	K6FCY (Sept.)	205
WØWGB	128	VE1FH	104	W4BWR (Apr.)	100
W6USY	111	WØZWL	102		

More-Than-One-Operator Stations

W1AW	175	W3YDX	106

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W4BWR.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

SUPPLEMENT TO NET DIRECTORY

The following list will supplement and correct the listing on page 59, November *QST*. Please inform us promptly of any errors or omissions so that they can be included in the March *QST* installment. An asterisk (*) indicates correction from previous listing in November *QST*. This listing brings the record up to date as far as November 17th, 1955. Registrations received later than this date will appear in the March *QST* supplement.

Name of Net	Freq.	Time		Days
Ala. Emerg. Net L (AENL)	3945	1730	CST	Wed.
Ala. Teen Age Net (AENT)	3910	1700	CST	Mon., Wed., Fri.
		0600	CST	Sat.
		1400	CST	Sun.
Alberta Phone Net	3765	1930	MST	Mon., Wed., Fri.
Amateur Radio Caravan Club of New Mexico, Albuquerque Chapter	29,600	1930	MST	Wed.
AREC Net (Calif.)	3900	1030	PST	Sun.
AREC 10 Meter Fone Net	29,640	2100	EST	Tue.
American Legion Amateur Radio Net	3975	1900	PST	Daily
American Red Cross Amateur Communications Service	29,600	1930	EST	2/4 Mon.
Amesbury, Mass., CD Net	29,626.8	1900	EST	Wed.
Anthracite Net (AN) (Pa.)	3610	1900	EST	Mon.-Sat.
Arizona CW Net (AZN)	3690	2000	MST	Tue., Thu.
Arizona Emergency Net (AEN)	3865	1900	MST	Tue., Thu.
Arizona Traffic Net	3865	0800	MST	Daily
		1200	MST	
		1600	MST	
Arkansas CW Net (OZK)	3790	1900	CST	Mon.-Fri.
Arkansas Phone Net	3810	1900	CST	Mon.-Fri.
Arlington (Mass.) RACES Net	53,400	2100	EST	Wed.
Atlanta Ten Meter Phone Net	29,600	2200	EST	Sun.
Badger Emerg. Net (BEN)	3950	1800	CST	Daily
BARA 80 CW Net	3570	2030	EST	Wed.
Bathurst & Campbellton Area AREC Net (N.B.)	3790	1030	AST	Sun.
Bloomfield (N.J.) Communications Group	145,320	1100	EST	Sun.
Blue Ridge 160 Meter Net (BRN) (Texas)	1880	0830	CST	Sun.
Boston Emerg. Amateur Net	28,700	1930	EST	Mon.

Breakfast Club (N.M.)	3838	0700	MST	Mon.-Sat.
British Columbia AREC Net (BCAREC)	3755	1800	PST	Mon.-Sat.
Buckeye Net (Ohio)	3580	1900	EST	Mon.-Sat.
Butte Emerg. Net (Mont.)	3955	1930	MST	Last Fri.
Buzzards Roost Net (Mich.)	3930	1730	EST	Mon.-Fri.
Calumet Area Emerg. Net	1805	1900	CST	Mon.-Fri.
Cape Breton Emerg. Net (N.S.)	3750	1300	AST	Sun.
Cape Cod and Island Net*	3912	0730	EST	Mon.-Sat.
Caravan Club, Albuquerque Group	3855 29,600	1930	MST	Wed.
Caravan Club of Texas	3995	1300	CST	Sun.
CARS Oakland County Net (Mich.)	29,610	2000	EST	1/2/4 Wed.
Central Illinois Net (CIN)	1815	0830	CST	Sun.
Catalpa Amateur Radio Society Net (Mich.)	3970 29,610	1000 0900	EST EST	Sun. Sun.
Central Valley Net (Calif.)	3525	1900	PST	Mon.-Fri.
Clark Co. (Ohio) Amateur Radio Emerg. Comms. Club Net	3860 145,260	1300 1900	EST EST	1/3 Sun. Tue.
College Traffic Net (CTN)	3630	1600	EST	Mon., Wed., Fri.
Colo. Emerg. Phone Net	3890	0830	MST	Sun.
Conn. Nutmeg Net (CN)	3640	1845 2100	EST EST	Mon.-Sat.
Conn. Phone Net (CPN)	3880	1800 1000	EST EST	Mon.-Fri. Sun.
Dade Emerg. Net (Fla.)	29,044	1930	EST	1/3 Mon.
Dallas 10 Meter Net	29,465	2000	CST	Mon.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C.W.	*PHONE*
3550 14,050	3875 14,225
7100 21,050	7250 21,400
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

Davidson Co. (Tenn.) Ten Meter Emerg. Net	29,600	1900	CST	Wed., Sun.
Davidson Co. (Tenn.) 2 Meter Emerg. Net	145,200	1930	CST	Mon., Thu.
Deep Sea Dragnet (DSD)	3970	1145	EST	Mon.-Sat.
Delaware Valley Amateur Radio Emerg. Net	146,250	1900	EST	Wed.
Delaware Valley Emerg. Net	145,350 145,440	2100	EST	Mon.
Delaware Valley 2 Meter Traffic Net	146,000	1930	EST	Sat.-Thu.
Delta 75 Net	3905	0700	CST	Sun.
Dog House Net (Ohio)	3860	1800	EST	Mon.
Dutchess Co. (N.Y.) 2 Meter CD Net	145,350	2100	EST	Mon.
Early Bird Transcontinental Net	3845	0445	CST	Daily
East Tennessee Net	3980	0645	EST	Mon.-Fri.
East Tenn. 2 Meter Net	145,200	1930	EST	Thu.
Eastern Mass. Novice Net (ENN)	3705	1500	EST	Mon.-Sat.
Eastern Pa. CD Net	3915	0830	EST	Sun.
Eastern Pa. CW Traffic Net*	3610	1830	EST	Mon.-Sat.
Eastern Sierra Net (ESN) (Cal.)	3925	1030	PST	Sun.
Elbow Benders Net (Mich.)	1806	2100	EST	Tue.
Fall River (Mass.) Emerg. Net	29,200	1900	EST	Wed.
Falmouth (Mass.) Emerg. Net	3585 14,050 145,420	1915	EST	Wed.
FARM Net	3935	1900	MST	Mon.-Fri.
Florida Hurricane Net (HN)	3695	0700	EST	Sun.

Meet all the presidents (past and present) of Trylon Radio Club, Inc., Queens, N. Y. W2KVG, W2ESZ and W2NAX are seated; W2OG, W2MSK and W2BNW standing. The occasion was the club's Tenth Anniversary Dinner, during which the six amateurs were awarded citations for distinguished services rendered. Trylon has been ARRL-affiliated since October 2, 1947.

Framingham (Mass.) Radio Club Emerg. Net	28,700 145,350	2045 2000	EST EST	Wed. Wed.
Garfield Emerg. Net (GEN) (Okla.)	3825	0900	CST	Sun.
Georgia Cracker Emerg. Net	3995	0800 1900	EST EST	Sun. Tue.-Thu.
Grand Rapids Emerg. Net	29,610	2030	EST	Mon.
Granite State Phone Net (GSPN) (N.H.)	3842	0900 1700	EST EST	Sun. Tue., Fri.
Grave Yard Network	3885	0400	EST	Daily
Green Mountain Net (Vt.)	3860	1200	EST	Mon.-Sat.
Hi Noon Net (HNN) (Colo.)*	3945	1200	MST	Mon.-Sat.
Humdinger Net (HDN)	7220	1200	EST	Sat.
Hurricane and Incident Radio Net (HAIR) (Fla.)	29,560	1900	CST	Mon.
Illinois CW Net (ILN)	3515	1830	CST	Mon.-Fri.
Ill. Emerg. Net (IEN)	3940	1730 0900	CST CST	Tue., Thu. Sun.
Indiana CW Net (QIN)	3656	1600 1830 2200	CST CST CST	Mon.-Sat.
Interstate Single Side Band Net	3985	2000	EST	Daily
Iowa 160 Meter Net	1815	1815	CST	Daily
Iowa Tall Corn Net (TLCN)	3560	1830	CST	Mon.-Fri.
Kankakee C.D. Net (Ill.)	145,800	2100	CST	Mon., Thu.
Kansas CW Net (QKS) *	3610 1888	1830	CST	Mon.-Fri.
Kansas Novice Net (QKN)	3735	1500	CST	Sun.
Kansas 75 Meter Phone Net (KPN)	3920	1230 0800	CST CST	Tue., Wed., Fri. Sun.
Kans. Slow Speed Net (QKS SS)	3610	1800 1500	CST CST	Sat. Sun.
	1888			
Kennehoochee Emerg. & Traffic Net (Ga.)	29,460	2130	EST	Sun.
Kentucky Net (KYN)	3600	0900 1700 1900	CST CST CST	Daily
Kentucky Phone Net (KPN)	3960	1300	CST	Daily
Lake Co. Civil Defense Net (Ind.)	147,300	1830	CST	Daily
Lake Erie Emerg. Network	29,150	1315	EST	Sun.
Lancaster (Pa.) Emerg. Net (LEN)	146,800	2200	EST	Mon.
Linn Co. (Ia.) Emerg. Net	3915	1600	CST	Sun.
Long Beach Civil Defense & Emergency Net (Calif.)	29,560 147,300	2015 2030	PST PST	Mon. Mon.
Malden (Mass.) Emerg. Net	29,540	1930	EST	Mon.
Manitoba ARRL CW Net (MAN)	3700	1830	CST	Mon.-Fri.
Manitoba ARRL Phone Net	3760	1245 1900	CST CST	Daily
Maritime Phone Net*	3750	2000	AST	Daily

(Continued on page 72)

Members of the Paso Robles Radio Club watch as W6TOP explains workings of recently-donated rig. Absorbed onlookers, from left, are: President W6BRY, W6AGO, KN6INB, K6END, W6BOZ, W6MOS, W6THA, W6FYW. Fifteen licensed amateurs (six not shown) keep l.f. and v.h.f. transmitters at club station W6LKF active in c.d. affairs and on 24-hour stand-by for emergencies.

(*Photo courtesy Paso Robles Sunday Review*)

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Maryland Delaware DC Section Net (MDD)	3650	1915	EST	Mon.-Sat.
Maryland Emerg. Phone Net (MEPN)	3820	1830	EST	Mon., Wed., Fri.
		1300	EST	Sat., Sun.
McKean Co. (Pa.) Emerg. Net	3525	0900	EST	Sun.
Michigan Emerg. Net	3930	0900	EST	Sun.
Mich. Noon Net CW (QMN)	3663	1215	EST	Mon.-Sat.
Mich. Slow Speed Net (QMN)	3663	1730	EST	Mon.-Fri.
Michigan TFC Nets (QMN)	3663	1730	EST	Mon.-Sat.
		1830	EST	
The Middlesex Net (Mass.)	3735	1500	EST	Sun.
Mike Farad Traffic Net	7238	1215	EST	Mon.-Fri.
Minn. Section Net (MSN)	3595	1230	CST	Mon., Wed., Fri., Sat
		1830	CST	Mon.-Sat.
Mission Trail Net (MTN)	3854	1900	PST	Daily
Missouri CW Traffic Net (MON)	3580	0700	CST	Mon.-Fri.
		1900	CST	
Mohawk Hudson Training Net (MHT)	3716	1300	EST	Sat.
Morning Conn. Net (MCN)	3640	0645	EST	Mon.-Fri.
Mt. Diablo Amateur Radio Emerg. Net	28,680 145,290	2000	PST	Mon.
Nassau Co. (N.Y.) 10 Meter Net	28,680 28,720	2000	EST	Thu.
Nebraska CW Net	3525	1845	CST	Daily
Nebr. 75 Meter Phone Net	3983	1230	CST	Daily
New Bedford Mass. Emerg. Net	29,610 29,400	1015	EST	Sun.
New Brunswick Amateur Radio Assn. Net	3759	1000	AST	Sun.
New England 75 Meter Phone Net	3870	0900	EST	Sun.
New Hampshire CW Traffic Net	3685	1900	EST	Mon.-Fri.
New Jersey CD-CW Net	3505.5	1900	EST	Sun.
		1015	EST	
New Jersey CD-Phone Net	3993	0930	EST	Sun.
New Jersey Net (NJN)	3695	1900	EST	Mon.-Sat.
N.J. 75 Meter Emerg. Phone Net (JN)	3900	0900	EST	Sun.
		1800	EST	
New Mexico CW Net *	3633	1900	MST	Daily
N. M. Emerg. Phone Net	3838	0730	MST	Sun.
		1800	MST	Tue., Thu
New York State Net (NYS)	3615	1830	EST	Mon.-Sat.
Newport Co. (R. I.) Emerg. Net	29,530	1000	EST	Sun.
Newton (Mass.) CD Network	53,640	1830	EST	Sun.
Ninth Regional Net (9RN)	3640	1630	CST	Daily
NYC-LI CW Traffic Net (NLI)	3630	1930	EST	Mon.-Fri.
		1900	EST	Sat.
Newfoundland Net	3750	1900	NST	Daily
Night Owl Net	29,000	2300	EST	Sat.
N. Dak. 160 Meter Screwball Net	1992	1230	CST	Mon.-Sat.
Northeastern Area Barnyard Net	3960	0800	EST	Mon.-Sat.
Northern Calif. Net (NCN)	3635	1900	PST	Mon.-Fri.
		2130	PST	
Northland Net (Que.) (NN)	3710	1900	EST	Mon., Fri.
	3755	1915	EST	Wed.
Novice Hurricane Net (NHN) (Fla.)	3725	0800	EST	Sun.
Novice Rebel Net (Fla.)	7150	0600	EST	Sat.
Oakland Co. (Mich.) A.R.E.C. Drill Night	29,610	2000	EST	3rd Wed.
Ohio CW Net (BN)	3580	1900	EST	Mon.-Sat.
Ohio Emergency Net	3860	1800	EST	Thu.
Ont. Civil Defense Phone Net	3765	1900	EST	Tue., Thu., Sat.
Ontario Phone Net (OFN)	3765	1900	EST	Mon., Wed. Fri.
Ontario Section Net (OSN)	3530	1900	EST	Daily
Oregon Emergency Net	3840	1800	PST	Daily
		1900	PST	
Oswego Co. (N. Y.) Civil Defense Net	147,150	2000	EST	Sat.
Ottawa Six Meter Emerg. Net	50,400	2100	EST	Tue.
Palmetto Net (FN) (Fla.)	3675	1830	EST	Mon.-Sat.
Penna. Fone Net (PFN)	3850	1800	EST	Mon.-Fri.
PI-Net (Minn. YL Net)	3838	0900	CST	Tue.
Pine Tree Net (PTN) (Me.)	3596	1900	EST	Mon.-Fri.
Potomac-Rappahannock Valley Net (PRVN)	3935	0900	EST	1/3 Sun.
Province of Quebec Net (PQN)	3670	1915	EST	Mon., Wed. Fri.
"Provincial Mike" Club (Ont.)	3755	1400	EST	Sun.
Puerto Rico Amateur Emergency Net	3559	2000	AST	Mon.
	3925	2000	AST	Wed.
Putnam Co. (N. Y.) Emergency & C.D. Net	3890	1330	EST	Sun.
QMN Fast Net (Mich.) (QMN)	3663	1830	EST	Mon.-Fri.
Quad City Amateur Emerg. Net	29,500	2100	CST	Sun.
Quarter Century Wireless Assn. Net	3810	1100	EST	Sun.
Quebec Emergency Net (QEN)	7150	1030	EST	Sun.
Quincy, Mass., Emerg. Net (QEN)	28,620	1915	EST	Mon.
	146,800	1000	EST	Sun.
		1915	EST	Mon.
Quincy, Mass., Sector 1-B CD Net	28,590	1930	EST	Mon.
RTNET (Calif.)	147,850	2000	PST	Tue.
Rhode Island Traffic Net (RIN) *	3540	1900	EST	Mon.-Sat.
Rockland Co. (N.Y.) AREC Net	29,600	1930	EST	Wed.
	147,210	1930	EST	Mon.
Saints of 75	3935	0500	EST	Daily
Saskatchewan ARRL Phone Net	3780	1830	MST	Daily
Savannah River Net	3807.5	1230	EST	Sun.
Schenectady Emergency Communications Net	3950	1400	EST	Sun.
Sector 1B Net CD, Quincy, Mass.	147,300	1930	EST	Mon.
Show-Me Net (SMN)	3580	1600	CST	Sun.
Sixth Regional Net (RN6)	3615	1945	PST	Daily
		2130	PST	
South Carolina Net (SCN)	3795	1900	EST	Mon.-Fri.
S. Dak. 160 Meter Phone Net	1905	2000	CST	Daily
Southern Calif. Net (SCN)	3600	1930	PST	Mon.-Sat.
		1000	PST	Sun.
Southwest La. Emerg. Net *	3850	1400	CST	Sun.
Starved Rock Radio Club Net	3920	1100	CST	Sun.
Susquehanna Emergency Net	3910	0800	EST	2/4 Sun.
Tar Heel Net (N. C.)	3865	1930	EST	Mon.-Fri.
Tarrant Co. (Tex.) Disaster Control Net (TCDCN)	3970	1300	CST	Sun.
Teenagers Traffic Net (TAN) *	3630	1830	EST	Daily
Tenn. Sectional Net (TENN)	3635	1900	CST	Mon.-Sat.
Tenn. 75 Meter Phone Net (TPN)	3980	0645	CST	Mon.-Sat.
		1800	CST	Tue., Thu.
		0800	CST	Sun.
Tenth Regional Net (TEN)	3545	1700	CST	Mon.-Sat.
		1945	CST	Mon.-Fri.
		2130	CST	
Third Regional Net (3RN)	3590	1830	EST	Mon.-Fri
		1945	EST	
Texas YL Round-Up Net	3880	0900	CST	Thu.

Traffic Exchange Net (TXN)	7106	1900	CST	Daily
Transcontinental Phone Net (TCPN)	3970	1700	EST	Daily
Trans Continental Relay Net (TCRN)	7042	0215	GMT	Daily
		0615	GMT	Daily
		1600	GMT	Daily
Tropical Phone Net	3945	1730	EST	Daily
Tucson (Ariz.) Fone Net	29,000	2000	MST	Daily
Tulsa Co. 75 Meter Emerg. Net	3860	1330	CST	Sun.
Twin City Emerg. Net (TCEN) (Ill.)	28,560	2100	CST	Tue., Thu.
Two by Four Section Net (Calif.)	145,800	1845	PST	Mon.-Fri.
Union Co. (N. J.) AREC Net	146,940	2000	EST	Tue.
U. S. Coast Guard Auxiliary Net (2nd Dist.)	3865	1930	CST	1/3 Thu.
Upper Ohio River Emergency Network	3585	1930	EST	1st Sat.
		0930	EST	1st Sun.
Vermont CW Net (VTN)	3520	1830	EST	Mon.-Sat.
Virginia CW Net (VN)	3680	1900	EST	Mon.-Fri.
Va. Slow Speed Net (VSN)	3680	1830	EST	Mon.-Fri.
Walpole (Mass.) Emerg. Net	145,500	1930	EST	Mon.
Waltham (Mass.) CD Net	146,800	1930	EST	Mon.
Wash. Section Net (WSN) *	1988	1930	PST	Mon.-Fri.
	3575	1900	PST	Mon.-Fri.
Wash. Amateur Radio Traffic System (WARTS)	3970	1800	PST	Mon.-Sat.
Weather Amateur Radio Network	3675	1830	EST	Mon., Wed., Fri.
West Park Radio Ops Emerg. Net	29,520	2200	EST	Mon.
West Virginia CW Net	3570	1900	EST	Mon.-Sat.
West Virginia Phone Net	3890	1830	EST	Mon.-Fri.
Western Penna. ORS Net	3585	1900	EST	Mon.-Fri.
Western Nebraska Net	3685	1230	MST	Sat.
	3850	1230	MST	Mon.-Fri.
Whittier (Cal.) Emerg. Net	3885	1900	PST	Thu.
	29,520	1930	PST	Thu.
	145,280	2015	PST	Thu.
Winthrop (Mass.) Emerg. Radio Net	146,520	1830	EST	Mon.
Wisconsin CW Net (WIN)	3685	1900	CST	Daily
Wis. RACES (State OCD) Net (SCDWISC)	3505.5 3993	0800	CST	Sun.
Wisconsin Phone Net	3950	1215	CST	Mon.-Sat.
		0930	CST	Sun.
Wood-Ridge, N. J., Civil Defense Net	145,680	2000	EST	Wed.
Worcester Civil Defense Phone Net	28,720	1930	EST	Mon.
Wyoming Pony Express Net *	3920	0830	MST	Sun.
Wyoming Weather Net *	3925	0700	MST	Mon.-Sat.
"YO" CW Net *	3620	1830	MST	Daily
York (Pa.) Emerg. Net	145,620	2200	EST	Mon.

BRIEF

ARRL through its field organization and W1AW has for some years provided radio bulletin (OBS) service to members. Currently there are *six* OBS SCM-appointee stations as the average number in *each one* of the 73 ARRL Sections that put out ARRL bulletins, not to mention W1AW. The RSGB (Sept. '55) now announces inception of an RSGB radio bulletin service for British amateurs on 3600 kc. for both voice and c.w. Each bulletin text gets prior formal approval by the G.P.O. British amateurs may use a 150-watt maximum power in their 3.5-3.8 band limits so it will take good winter night conditions to pick up one of these. Services of, by and for the member in Australia have been extended by the Wireless Institute of Australia to include Observers, with somewhat similar functions to our ARRL OOs to be on call to give a critique on adjustments and signal quality.

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Armed Forces Day, 1955, saw this emergency field position established at Camp Pendleton, Calif., as part of a number of displays given in connection with the event. The display was put on by the Palomar Radio Club, and the station call used was W6IAB. That's K6AKO talking into the mike, with M/Sgt. K6HZF in the background.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH....262	W6SYG....251	W2AGW...248
W6VFR....257	W0YXO....250	W6MEK...248
W6AM....256	W8NBK....250	W7AMX...248
PY2CK....253	W6MX....250	W2BXA...247
W3BES....252	G2PL....250	W3KT....247
W8HGW...251	W3GHD...250	W5ASG...247
W6ENV...251	W6SN....249	W8BRA...247
	W3JTC....249	

Radiotelephone

PY2CK....246	W1JCX....219	W8HGW...214
W1FH....234	W1MCW...219	W5BGP...214
VQ4ERR...233	W1NWO...217	W9NDA...213
ZS6BW....228	XE1AC....215	SM5KP...211
	W3JNN....215	

From October 15, to November 15, 1955 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W6WLY....122	OH5OE....106	GM3WO...102
W6DIX....116	CT1ER....105	W2IWC....101
OH1PN....115	W6ULS....104	W9PNE....100
LA4DD....114	EA7CP....104	OH2NQ....100
DJ1DF....110	W4YHD....103	VE6VK....100
W2OGE....106	OH1PZ....103	YO2BU....100

Radiotelephone

EA2DJ....110	CT1ER....102	W2PQJ....100
TI3LA....103	EA2CB....101	WØDXE...100
W8WZ....102	SM5RY....101	OH1PN....100

ENDORSEMENTS

G4CP....240	HB9ET....160	W2CR....131
W2GT....221	W8MWL...156	W5UUK...130
W3KDP....210	W2FXE....151	W9RKP...130
W8UAS....210	W2ABM...150	G2FXB....130
W5CKY....192	W2CWK...150	HB9IM....126
F8PQ....191	W9JIP....150	W2MZB...125
W9FJB....182	W9VP....150	DL3FM....124
W5BZT....181	G8KU....150	WØIDI....121
W6CTL....180	FA9RW....148	W3VRJ....120
W6TXL....173	ZL2HP....143	DL4ZC....120
W1HRI....171	W4CKB...140	LA4KD....120
W5DML...170	G6VQ....140	W1OJR....115
W6NGA....170	W3BNQ...139	K2GMO...110
W8NLY....170	W7KWO...137	W3CPB....110
G3AAE....161	OH3RA....136	W3EQK....110
W3MFW...160	I1CZE....134	W3RBW...110
DL1KB....160	VE7YR....134	W3VOS....110
	W5ABY....132	

Radiotelephone

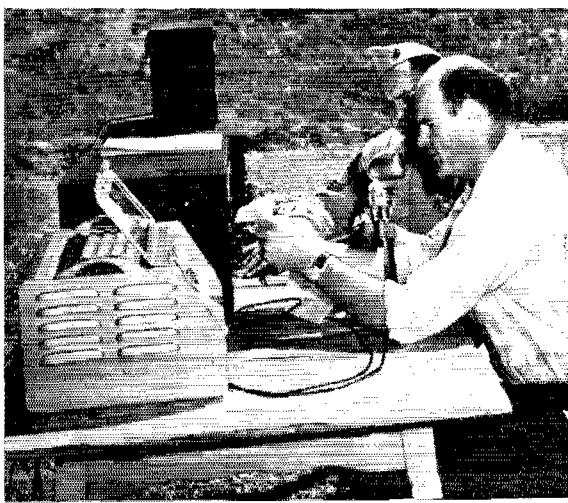
CM9AA....201	W8QJR....160	I1CTE....132
LU4DMG...180	KH6OR....160	W1HRI....122
PY4VX....170	YV5EC....160	WØJYW...122
F8PQ....162	PY4PI....141	W6SYG....120
W6GVM...161	W8MWL...140	PY4LP....120

W/VE/VO Call Area and Continental Leaders

W4BPD....241	VE4XO....118	VE8AW....160
W9NDA...246	VE5QZ....140	VO6EP....190
VE1HG....150	VE6GD....108	ZS6BW....235
VE2WV....189	VE7HC....209	4X4RE....218
VE3QD....210		ZL2GX....241

Radiotelephone

W2APU....202	W7HIA....181	VE5YE....140
W2BXA....202	WØAIW....191	VE7ZM....140
W4HA....191	VE1CR....120	ZL1HY....196
W6AM....209	VE2GQ....114	OD5AB....170
	VE3KF....163	



Generally speaking, agencies served by the AREC during emergencies do not make a habit of looking gift horses in the mouth. That is, they are usually lavish in their praise of work done, but extremely reticent about criticizing. This attitude is natural enough, and yet it contains the danger of giving AREC groups the feeling that there is nothing to be desired in their setup.

AREC groups who let such praise, by people entirely unaware of the potentialities involved, go to their heads are being very foolish, it seems to us. We have seen and worked with many excellent AREC and RACES groups; but we have yet to see one which is perfect. The progressive EC/RO will continually strive for progress and improvement, both of which are always possible — for perfection is something we endlessly aim for but seldom if ever achieve. Don't rest on your laurels. There is work to be done.

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A call from the El Paso City Police to W5SGA, at 1930 July 12, 1955, alerted the El Paso Emergency Net to assist in furnishing communications in a flood that left water four feet deep throughout one of El Paso's suburban areas. Twenty-three mobile units were on the scene within minutes after being alerted and patrolled the perimeter of the flooded areas, reporting to police the direction flood waters were moving and the speed of movement, until well past midnight. This enabled the police to quickly determine which areas required warnings and road blocks to prevent anyone from being trapped within the danger area or from running into washed out bridges.

The following mobiles provided continuous watch and communications throughout the danger period: *W5s* SQM KBP UBN ZOQ JEN MXY YWF JSJ SGA MEM YGP HPQ PGD BQU KOK RUO FSH PSX QOS; KN5AAV; W4SSS; *WØs* LVS FZZ.

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Our Georgia SEC, W4CFJ, reports that all members of the AREC in Georgia played a big part in handling emergency traffic in hurricanes Connie, Diane and Ione. The Georgia Cracker Net, the Atlanta Radio Club and members of the Confederate Signal Corps did outstanding work. W4CFJ himself worked 48 hours with the regional office of the American Red Cross communicating with towns which were cut off by the storm.

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During Hurricane Janet, which hit Honduras a tremendous blow late in September, WØCPM indicates that he was instrumental in helping VP1AB and VP1EE maintain contact with each other and establish communications lines within the stricken country. He also was able to give local newspapers some information on the destruction caused by the hurricane as told to him by VP1AB. Most of the record communications in the case were handled via Tropical Wireless, and Western Union. W5HR in New Orleans, who was listening, made a tape of the communications between WØCPM on the one hand and VP1s AB and EE and replayed them for the benefit of the British Consul in New Orleans, who relayed them on to Belize commercially. Contact was conducted for the most part on 20 meter phone.

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We have before us a 26-page single-spaced elite-typed manuscript of the operation of W3CVE's Transcontinental Relay Net (TCRN, 7042 kc.) during hurricanes Connie through Janet in the late summer and early fall of 1955. This net follows the path of each hurricane from the time it is first spotted until it peters out, and attempts are made to keep in touch with any amateurs operating from within the disaster area. Members of the net maintain close contact with their local weather bureaus and the Red Cross, both to obtain and give information or provide communications as the case may require. In this activity, both weather bureau and Red Cross officials concerned have expressed their pleasure at being thus served. A total of 395 messages were handled, with 146 different stations participating.

Unfortunately space does not permit a rehash of all the details of TCRN's operation during this period of alert of semi-alert for a total period of 1,296 hours. At the very least, we want to list the call of everyone who participated, and we do so herewith, while the full TCRN report becomes a matter of record: *W1s* AKG BGJ BXH CGS DDF DFY GFC JFG KMS QA QGU SPV TEG VSW WCC WFZ WU; *K1s* USA FAJ;. *W2s* BO DND EGQ EQG GQO GOD HEV KMZ KVH MUM OEG OQG QDM RNN TK YIH/1 ZAA; *K2s* ARH AMP CJ EQA GQO GXL HEV NEV QOM; *W3s* BFF CUL CZY FWR IA LQZ RRI UOE WOR WV WZL YYC; *W4s* AMZ ANN ATA BFQ DQV EDB EJP EJV FXM HIH IAS LM LVV MUX MCY PVA RTK SCF SVG TKR UBP UWE VJT VOS; *K4s* AF AIT EMC WBK; *W5s* BZI CGI/1 FKX GDH GND OSZ OWV RN WQN/3 YPZ ZQU ZY; K5AUL; *W6s* DF KYV TTX; *W7s* TKB TVF; *W8s* DNC DLZ EA ENP HZA IZQ JWG VOP/2; *W9s* ALM BKN CXY DUA LHI MRN RHA SG UNG VNI ZNG; *WØs* CIO KA NIY OHJ SCA UC; VE2DR; *VE3s* AAU AXE BJV BNQ BUR EAM GI IA; KP4AAC UH; KZ5BE.

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W6REF, Santa Barbara RM, submits further details on the forest fire situation reported in December *QST*. It seems that K6JUN first spotted the fire while on duty at KEY-T television station, and later was forced to evacuate. K6DOB, chief engineer, visited the site later by helicopter, maintaining contact with W6AET, later returning by jeep to put the station back on the air. *K6s* JGP HKL and EUM worked with the Forest Service at the Refugio repression station for six days. K6ATX served as liaison between the amateurs and the Forest Service. *W6s* HUT GH and *K6s* LFQ and ELR loaned their 2-meter equipment to the Forest Service, and K6EAQ loaned his 75-meter rig. K6CJ mobiled to the site of the fire and relayed back to K6NBI to keep local residents informed of possible danger. W6MSG and W6AWY provided relays whenever they became necessary. Others active included *W6s*

♦

These El Paso mobiles participated in the local Operation Alert CD exercise last June. They are, left to right, *W5s* QVJ SGA JCT JEN HYG and BQU.

♦

THG ERB JCQ BOU, *K6s* EAQ CZD and W7HAM/K6-JDT. The Forest Service has stated through its Santa Barbara headquarters that communications would have broken down completely had it not been for the assistance of the amateurs.

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Seventeen sections reported in the AREC for September activities: W.N.Y., San Joaquin Valley, Colo., Wash., Ga., Tenn., E. Fla., E.N.Y., Minn., So. Texas, Ore., Ala., *Santa Barbara*, Kentucky, N. Texas, Montana, Wis. Italicized section is a new reporter for 1955. AREC members represented totalled 4991. This is a very small improvement over the same month for 1954.

RACES News

FCDA, under dates of October 1 and October 15 respectively, has produced a set of specifications for A.M. "Utility Portable Transmitter-Receivers" for the 118-152 and 50-54 Mc. portions of the spectrum. Note that the former segment encompasses the amateur two meter band and the latter segment *is* the amateur six-meter band. Previously, FCDA specifications for equipment on these bands considered only f.m., thus leaving out most of the equipment used by amateurs. At least one well-known manufacturer is now in production of equipment designed to meet these specs.

We believe these specifications were drawn up with the amateur service (RACES) in mind, to answer a long-standing need for use of matching funds in procuring equipment to be used in RACES. If your c.d. people are hesitant to expend funds on radio equipment for RACES, it might be well to call their attention to the "Utility Portable Transmitter-Receiver" specs of Oct. 1st and 15th.

W1AW OPERATING SCHEDULE

(All times given are Eastern Standard Time)

A lithographed local map showing how to get from main highways, or from the Hq. office, to W1AW will be sent to amateurs advising their intention to visit the station. Also, master schedules showing complete W1AW operation in EST, CST or PST will be sent on request.

Operating-Visiting Hours:

Monday through Friday: 1500–0300 (following day).

Saturday: 1900–0230 (Sunday).

Sunday: 1500–2230.

Exceptions: W1AW will be closed from 0230 Jan. 1st to 1500 Jan. 3rd in observance of New Year's Day, and from 0300 Feb. 22nd to 1500 Feb. 24th in observance of Washington's birthday.

General Operation: Use the chart on page 61, Nov. 1955 *QST* for determining times during which W1AW engages in general operation on various frequencies, 'phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous days in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies (kc):

C.w.: 1885, 3555, 7125, 14,100, 21,010, 52,000, 145,600.

Phone: 1885, 3945, 7255, 14,280, 21,350, 52,000, 145,600.

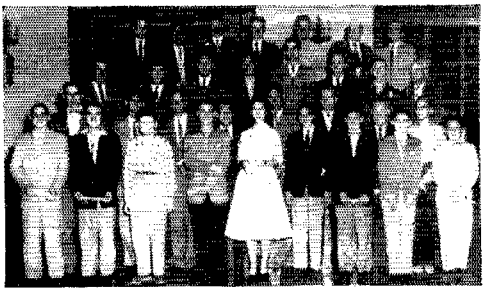
Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times:

Sunday through Friday: 2000 by c.w., 2100 by phone.

Monday through Saturday: 2330 by phone, 2400 by c.w.

Code Proficiency Program: Practice transmissions are made on the above listed c.w. frequencies, starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. *Exceptions:* On Feb. 14th W1AW will transmit a special Frequency Measuring Test and on Jan. 17th and Feb. 15th W1AW will transmit ARRL Code Proficiency Qualifying Runs instead of the regular code practice.



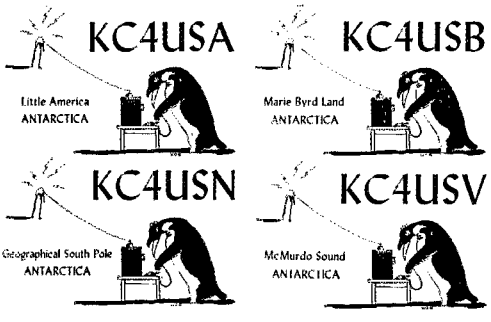
Thirty-two of the club's Novice "Class of '55" turned out for the Joliet (Illinois) Amateur Radio Society's First Annual Novice Banquet on September 24th. In the front row, from the left, are the youngest members, aged 12 to 15: WN9AGD, W9UCW, W9UBI, KN9ARU, W9UDL, WN9ZFB, WN9YMY, WN9YRH, KN9ATZ. Six more graduates of the JARS school are not shown.

EXPEDITION ARRIVING ANTARCTICA

We're indebted to Owen Perry (ETC USN), W3NOT, with the expedition, and to C. W. Franklin (CWO USN), K4GDU, Asst. Staff Communications Officer, Atlantic Fleet Task Force 43, Operation Deepfreeze, for additional news to that presented in November *QST*.

Leaving New Zealand in mid-December, the expedition ships are penetrating the several hundred miles of pack ice, to arrive at the Ross Sea points designated for establishing bases by the first week in January, barring unforeseen circumstances. The antarctic program is headed by Rear Admiral Richard E. Byrd. March first is the anticipated date for start of two-way work with radio amateurs. The main bases, we are told, must first be completed by Naval construction personnel during January and February.

All stations will be using Collins KWS-1 transmitters and 75A-4 receivers. S.s.b., a.m. phone and c.w. will be employed. The expedition cards will conform to the patterns shown here, and will hear the official cachet drawn by Disney for Expedition Deepfreeze. KC4USA and KC4USV are expected on around March 1st, the others in December when the advance bases in Marie Byrd Land and near the Pole have been set up. Mail from the four stations cannot be received until the ships return in 1957, but amateurs are assured all QSOs *will be confirmed!* The men who winter over will be depending on amateur radio



for messages and contacts with their families, and Mr. Perry says directional CQs will be numerous. All cards from our end may be sent right after QSO to Staff Comm. Officer, Task Force 43, Room 831, Old P.O. Bldg., 12th and Pennsylvania Ave. N.W., Washington, D. C.

According to K4GDU, there has been a gratifying response in advance of sailing from amateurs in 25 states, D. C., Canada and Canal Zone. News clippings from W1PFA and W5DDQ, club offers of assistance (via W3WV, W3ZGD, K6OGL, W8UTN) and offers of aid from *scores* of other amateurs, representing every U. S. licensing area, indicate the strong desire of amateurs to assist in TF43 Expedition communications.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Clarence Snyder, W3PYF — SEC: NNT. PAM: TEJ. RM: AXA. EPA nets: 3850 and 3610 kc. PVY reports that the AN Net is ready to welcome newcomers to train in net procedure on 3610 kc. at 1900 EST. VBI and YGX will run code classes for the Lancaster Radio Transmitting Society on Wed. nights. New officers: MWL, Hill School, 5AHS, pres.; K2ESQ, vice-pres.; 8LHL, secy. URU, URT, URS, WML, SAE, PQV, and DHJ provided two-way communication for the JC Jalopy Derby on Oct. 1st. ADE has a new Ranger. CBZ got his 25-w.p.m. CP certificate. ZRQ is a new ORS. FZR now is mobile. VSD is building a new 10-meter rig. UUA is back on the air after a 4-month layoff. EAN has a new beam on 15 meters joining his 20-meter job. BUR got his 30-w.p.m. CP certificate. BTN operated portable from the Telford Police Department during Halloween. WN3DWN is a new call on the air with a new NC-300 and Viking II. YWW is doing a good job of editing the *North Penn Static* for the North Penn ARC. Eighteen mobile RACES licenses have been issued to members of the Philmont Radio Club. Philmont's *Blurb* lists the activities of members during the "Diane" emergency YDX is installing a 20-meter beam on a 40-foot tower on the roof of a 7-story building. Berks County now has an approved RACES plan through the efforts of Radio Officer BN. Once again we invite the coöperation of secretaries of clubs in the area in asking for the submission of monthly reports on the 30th of the month to be included in this column. These reports should list the activities of members such as new equipment or new awards, etc. I would like to make this your column and the information supplied by amateur groups or individuals is my only way of knowing what is going on. PVY reports he is the first to get a box of cigars for working 5 hams in Red Lion, Pa. Cheltenham High School has a new amateur radio club, and is applying for a club station call. GNA recently was voted Mr. Typical Teacher by the Abington Township Teachers Association and a nice write-up and picture was run of GNA and his XYL in the *Philadelphia Inquirer* magazine section. CUL and YDX made BPL for the month of October. Traffic: W3CUL 714, YDX 352, OK 216, TEJ 124, YVX 98, OGD 74, DHJ 64, BUR 48, ZBW 38, AXA 37, ELI 35, WDK 28, BNR 27, DUI 19, PVY 16, PYF 14, ZRQ 10, EAN 4, ZOM 4, YUW 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, John W. Gore, W3PRL — The consensus of opinion is that the band openings during September and October promise increased activity. Many who have been off the air are returning to participate in the increased DX activity. BCP put his new DX-100 on the air in September. CDG is moving to a new QTH in Westminster with more room for an antenna farm. RV is changing his 6-meter rig from 2E26 to p.p. 6146. CDQ has made preparations to be ready for all contests and in the meantime maintain her contacts on 40-meter c.w. MCG spent 5 weeks in New Mexico. WKB is building a mobile rig for 75/10 meters. New officers of the Delaware Emergency Net are HC, TBG, and 9OSZ/3 as directors, and SPL as NCM. ECP spent several weeks touring New Jersey and New York and during the trip had some fine 10-meter mobile contacts. ZME spent 15 hours and made 125 contacts on 80, 40, and 20 meters in the CD QSO party. CVE reports that he has completed a 25-page summary on the TCRN alert during the hurricane season Aug. 8th–Sept. 30th, showing 1,296 hours, 395 messages, 233 bulletins, and 146 QNIs. On Oct. 10th, the Chesapeake Amateur Radio Club presented BYG, who gave a talk on "Matching Antenna Impedance," and on Oct. 24th presented a movie, "Underwater Photography in the Caribbean." GKP has set up emergency power to be ready for any emergency. The Washington Radio Club held a special meeting Sept. 30th and visited the U. S. Naval Observatory in Washington, where they enjoyed watching the operation of the Observatory's 21-inch telescope as well as the complete electronic installation. The Club started its beginners' code and theory classes on Oct. 6th, which will continue each Thurs. evening at the Chevy Chase Community Center on Connecticut Ave. AKB/BWT are on the air at their new QTH on 3.5-Mc. c.w. and on 3.9-Mc. phone with a Ranger. The Old Timers Club, now known as the Amalgamated Association of Ozone Sniffers, held its outdoor meeting on Oct. 15th at the CQ-10 Ranch of SG. The outing started at 2:30 P.M. and dinner was served at 4:30 P.M. As darkness approached, SG provided a bonfire, and a gabfest around the fire continued until the fire burned low at approximately 8:30 P.M. AKB and CDQ added the feminine touch to the Old Timers Meeting. The Greater Washington Area Hamfest, sponsored by the Rock Creek Amateur Radio Assn., was held Oct. 9th at the Fair Grounds, Gaithersburg, Md. RCN was on the air on 2, 10, and 75 meters to talk the mobiles in. In the main auditorium there was set up a rummage sale and in the afternoon an auction was held with FWR as auctioneer. The No. 1 prize, a Gonset Commander transmitter, was won by ECP. Second prize, an NC-88 receiver, was won by KCX. The Hamfest was held under the general chairmanship of FTP. YLs and XYLs of the Washington Area held a meeting at Rector's on Oct. 22nd, where they decided to organize and affiliate with the YLRL. It was decided that the local net be started on 7100-kc. c.w. at 9:30 each Wed. and on 3900-kc. phone at 8 P.M. each Thurs. 4DEE is drawing up the constitution and by-laws. During the month your SCM, PRL, and SEC, PKC, attended the meeting of the Antietam Radio Assn. in Hagerstown and your SCM also attended a meeting of the Hartford Amateur Radio Club at Aberdeen, as well as a meeting of the Eastern Shore Radio Club at Laurel, Del. on Oct. 28th. For the third year the Antietam Radio Assn. offered and provided successful communications for the officials of the annual Alsatia Mummers Parade on Oct. 29th in Hagerstown on 3827 kc. using the club call, CWC, with NHR and OYX operating. OXL/M was stationed at the Hagerstown High School where all parade units were to report, VAM/M was stationed at the starting point, and CSX/M was stationed at the finish point. JVZ operated as fixed station for relay purposes when the 75-meter QRM got too rough for the mobiles. Traffic: (Oct.) W3YYC 513, WV 406, K3WBJ 242, W3UE 178, CVE 177, COK 108, RV 103, UCR 97, MCG 55, PRL 26, PQ 25, PKC 23, NNX 20, ECP 16, ULI 14, OYX 13, OHI 8, JZY 4, CDG 3, WKB 1, ZME 1. (Sept.) W3WV 327, K3WBJ 230, W3YYC 198, YTI 68, COK 38, BCP 22, MCG 14, ONB 6. (July/Oct.) W3BUD 109.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — SEC: W2ZVW. PAM: W2ZI. SUG has been appointed EC for Hunterdon County. VMX now is located in Fair Haven. HDW is heard consistently on NJN with his new DX-100. RG continues to be top traffic man in the section. YRW is doing a fine job with the Delaware Valley Net (2 meters). K2JKC has applied for an ORS appointment. ASG spent a very enjoyable vacation in California. BAY reports the Monday night 6-meter round table still in operation. New members are always welcome. LS, an Official Observer in Pleasantville, has just completed a new 10-meter beam. CNI was nominated to head c.d. operation for Camden. K2PKG, Palmyra, is stationed at the Naval Reserve Training Center, Camden. QBH is vacationing in Florida. K2CWJ is very happy with his receiver. K2EFA informs us the Tri City Amateur Radio Club, Millville, has a project under way of building mobile converters and transmitters. This is a very fine undertaking and it is hoped other clubs will follow its lead. K2EFA is attending Rutgers. ZI reports that the Jersey Phone Net, 3900 kc., is activated on a daily basis and has 10 to 15 QNI nightly. We are indebted to ZI for a fine report of the N. J. Emergency Phone Net, which was activated well in advance of a flood condition along the Delaware. All points where trouble was anticipated were covered by mobile units, on duty for 13 hours, relaying information through the fixed station to C.D. Headquarters. The SJRA and the Burlington County Radio Club elected new officers. Other clubs, please advise me of change in officers and club activities. Traffic: W2RG 171, YRW 83, ZVW 82, HDW 36, K2JKC 33, W2ZI 27, SUG 16, K2BG 10, CPR 5, W2ASG 4.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RMs: RUF and ZRC. PAMs: TEP and NAI. NYS C.W. meets on 3615 kc. at 6:30 P.M.; ESS on 3590 kc. at 6 P.M.; NYS Phone on 3925 kc. at 6 P.M.; TAR on 3720 kc. at 4 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun.; TCPN 2nd call area on 3970 kc. at 7 P.M.; SRPN on 3970 kc. at 10:00 A.M.; ISN on 3980 kc. at 3 P.M. The

Syracuse V.H.F. Roundup was a big success. the RAGS mobile group had a taste of unsimulated wind, rain, and *cold* during the FS test at Hancock Field. OZR gave an interesting talk on "Lightning and Little Balls of Fire." TYM also gave a short talk and demonstration of a multi-band (80 through 10) antenna system based on 3DZZ's article in Mar. *QST*. SJV and ZOL visited JNM and K2DYB. AFP, EOM, AAO, and GM spoke at an MCWC meeting on "Hams in Hurricanes." K2DYB received his A-1 Operator's Club certificate. K2IXJ has a Viking II and NC-300 receiver. K2KIR and K2GVJ are teaching ARAA code classes. Officers of the Auburn ARA are K2DBB, pres.; W2WQZ, vice-pres.; K2CUQ, secy.; K2DOL, treas. ICE, QCF, GB, QY, and LF travelled to Mattapoisett to gather photographs of antique ham and commercial stations to add to the collection of the Rochester Antique Wireless Assn. K2AHH has a kw. on the air. K2IYP is supervisor of SRPN NCSs. KN2KTR worked a KN6 on 80 meters with 30 watts. RQF got the new 1625 modulator working FB. BTB has been appointed Air Force NYS Coordinator. I wish to thank all for your confidence in me and will endeavor to serve you as SCM for the next two years to the best of my ability. Rumor has it that UHI runs water through his 300-ohm transmitter line to keep it cool. Oswego Co. C.D. had 4 mobiles in the Auburn Alert under the leadership of ZHU. TON and K2DVC are on 420 Mc. EC renewals: TVO, ZHU, SBK, ZZG, JNM, and K2DYB. As ORS: COU and K2GWN. IYP has been appointed as OPS. K2EGO is EC for Ontario Co. UTH is RO for Ontario Co. VTR is in Turkey. K2CEH converted a standard coil TV tuner to a crystal converter for 2 meters. Oneida Co. participated 100 per cent in ARRL S.E.T. K2GWA has an NC-300, a B&W TR switch, a WRL755 VFO, a Q multiplier, and a pair of 4-65As in the final. K2JDD dropped the "N". FDI has a new QTH in Springfield, Mass. GHU was surprised to contact eighty 2-meter stations in the V.H.F. Contest. The Watertown ARC started Novice classes Nov. 1st. New KNs of the WARC are PFG, PDK, and PDL. The Upper River Valley Net meets on 3585 kc. Sat. at 1930 and on Sun. at 0930. K2CA now is located in Jackson Heights, L. I., N. Y. The Elmira ARA celebrated its 25th anniversary with a turkey banquet. 1UED, ARRL Asst. Secy., was the principal speaker. The RAWNY held its annual auction. While vacationing in VE3-Land QQ got VE3DJI's transmitter on the air. FE has a new 75A-4 receiver. The Corning ARA is conducting code and theory classes. ICE renewed as OO, OBS, and OPS. The RARA meeting was devoted to "gimmicks, gadgets, and gismos." The RARA DX gang knocked off some FB DX. AXR has a new ten-element beam on 2 meters. ALL, ELX, and UTH attended the Syracuse V.H.F. Roundup. COW is in Alaska. K2DMA is moving to New York City. TZI is on with an 813. K2BBJ has been in the hospital. RTB and WLU are back on 2 meters. PFI took a trip to the West Coast. KFU is putting a kw. on 6 meters. RUJ entertained his friends with a tower-raising party. Traffic: (Oct.) W2RUF 439, K2DYB 406, LSF 293, W2ZRC 244, K2IYP 186, AMZ 52, W2OE 52, ZLT 49, K2HVT 45, DSR 44, KIR 44, GWN 33, BKC 13, CUQ 13, DVC 10, DG 9, W2FEB 9, ZHU 8, KN2KIK 7, W2RUT 4, WS 1. (Sept.) K2IYP 139, AMZ 69, W2RQF 21, K2KIR 20.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: UHN, NRE, NUG, and GEG. PAMs: AER and LXE/VKD. The Western Pennsylvania Section Traffic Net meets Mon. through Fri. on 3585 kc. at 7 P.M. It is reported that the Allegheny-Kiski Amateur Radio Assn. is considering incorporating. In order to get some news of your activities in the space provided by the ARRL, I must first get word of said activities at this office before or immediately after the first of each month. Recently somehow SCARC and BARC news was missed. Your SCM is now completing the job of moving into a new home (same address). From the SHBP&M we note that the club station, PIQ, took part in the Breezeshooters Postal Zone Contest, mobile, located near the old County Airport, with QNI, QWW, QOQ, OWD, LDS, and VKS taking part. LDB has a new receiver for the "Blue Hornet." NKM is in a new QTH and is on 10 meters. BEX is the proud owner of a DX-100 or at least the parts thereof. The recent simulated c.d. alert was well represented by Zone 4 with LDB handling check-ins. Among those participating were QWW and SHT. YOA is working DX on 15 meters. The Indiana County ARC elected OTN, pres.; PHD, vice-pres.; YVC, secy.; LEJ, treas.; VKD, act. mgr.; YCG, asst. act. mgr. The Club adopted an emblem containing its call, BMD. In the DX Test it is reported that LMM made 477 c.w. QSOs and WPY made 412 on phone. SUK, in Burgettstown, still is making nightly skeds with 8IJG, West Richfield, Ohio, and recently has been directing CQs to the East at 2100 EST and has added a westerly CQ nightly toward Dayton. Anyone interested in 220-Mc. activity might make note of this and take a listen for him. The Radio Assn. of Erie has disposed of its mobile trailer and is looking for a replacement which will be more versatile and cheaper to maintain. STK reports twenty-one turning out for the Erie code classes (YMCA 7 P.M. each Tue.) A new emergency unit has been located; it is a '52 Metro van-type truck. In checking the efficiency of the c.d. siren recently, use was made of amateur mobile units for on-the-spot reports and any rechecks felt necessary and speeded up the evaluation of the effectiveness of the unit. MED has been put in charge of installation of equipment in the new truck. TXZ, DJA, and KJM are active on 6 meters. BFB is the proud owner of a new DX-100, as is BPB. Traffic: W3YUL 74, YA 69, UHN 55, ZEG 43, ZEW 37, KUN 35, SIJ 16, RVS 7, LOD 5, KNQ 4, NMJ 2.

CENTRAL DIVISION

ILLINOIS — SCM, George T. Schreiber, W9YIX — Section Nets: IEN 3940 kc.; ILN 3515 kc. PAM: UQT. RMs: BUK and MRQ. SEC: HOA. Cook County EC: HPG. A hidden transmitter hunt staged by the West Suburban Emergency Radio Net demonstrated its ability recently by locating and turning in to the police a stolen automobile. The two stations directly involved were OKI, who found the car, and GPV, the net control station. The calumet Area Emergency Net proved its worth at the recent Standard Oil seven-million-dollar fire in Whiting. Last month the Net had 22 formal sessions and handled 222 messages. WAX is studying electronics at the U. of I. and hopes to operate from YH. JO put up a 40-meter doublet to give that band a try for a while. DO figures he has handled 22,142 messages in 19 months of traffic-handling. Nice going, Art. PBI, who lost his crown in the Illinois F.M.T. to EDH, is pleased and surprised by the number of thank-you notes his OO work has returned. LZE has doublets on 80 and 40 and a three-element rotary on 10 meters. IDA is on the air with 600 watts of s.s.b. A new Novice call is BHT and new General Class licensees are K9KZM and JXN. New calls heard on ILN are MAK, OCB, MVU, and OBV. A teen-age net has been organized on 7250 kc. with ITM and KSD as temporary control stations. The Central Illinois Radio Club is pleased that the five Novices recently graduated from its code and theory class lost no time in getting on the air, including the 12-year-old operator. BPU reports from Downstate that KYW has a new Lysco, MRH built a new home and soon will be on the air, and CEU and PRV are still the undisputed square dance champs. NIU and SKR are glad that 20 meters is showing promise. CEH and MHC took first place in the Joliet Amateur Radio Society hidden transmitter hunt. LL traveled 4,000 miles on his vacation and KJ made a trip to Europe. They reported they didn't contact a fellow ham in their travels. FRP will spend January in Florida. If you add up the traffic totals of VEY, EZA, K9AMD and KN9AXS you will find it is a family group and all the messages were originated from one QTH, but from four transmitters. VBV is a freshman at Miami U. in Ohio and gets his radio time as an engineer and announcer at the campus broadcast station. BXC is back on 40 meters with a Ranger and plans a 160-meter Windom. October was a big month for CLH; he joined the Navy, got his WAS and a new electronic keyer. New officers of the Chicago Amateur Radio Club are SPT, and WFT, president and secretary-treasurer, respectively. IFA, Greene County EC, reports he has recruited PHE, ZMF, and RIB for the AERC. The Greenville College Radio Club was issued the call K9BJV, with ØFBX and ØHAY as president and secretary. ACU is in love with his NC-300. We hope to give the results of Illinois QSO Party in the next issue. Traffic: W9DO 1064, OR 347, IDA 161, CTZ 93, YIX 93, MAK 78, MRQ 78, HPG 64, BUK 58, FAW 39, STZ 29, TEM/9 29, CEE 22, DDP 22, LZE 22, VER 19, FCX 18, SXL 16, YFD 16, YYG 16, EHY 13, LXJ 11, OFR/9 10, REC 9, FRP 8, OCV 8, LL 7, SME 6, VEY 6, VQJ 6, ICF 5, MHC 5, EZA 2, K9AMD 1, AXS 1, KN9ATV 1.

INDIANA — SCM, Seth Lew Baker, W9NTA — Thanks for electing me SCM and I will do my best to do a good job. Please call on me if I can be of help in any way. We wish to thank BKJ for the fine work he has done as SCM the past two years. He has consented to act as Asst. SCM so we will have his valuable advice and help. LZI resigned as SEC after 4 years of outstanding service. Our new SEC is QYQ. Your support is asked to help him in AREC and RACES programs. Other new appointments: AYW as EC; JOZ as OBS; CEA, JYO, KTX, and SWD as OPSs; PQA, WLY as ORS; BBW as OO. The award for the outstanding amateur in Indiana went to EHU. UTL received an Old Timers Club certificate. ACN has a new DX-100. LCQ has a new rig. New officers of the TARS are RBV, pres.; YZO, vice-pres.; OVB, secy.; AIN, treas.; DGA, WUH, and W4CSN, directors; Paul Wertz, SWL director. Fifty-two attended the TARS dinner and heard Mr. Budlong speak. KLR worked his 24th state on 2 meters. EQO has a new SX-100. New officers elected at the Purdue meeting of IRCC were CMT, chairman; PAS, vice-chairman; GRA, secy.; WTY, treas.; BHV, EOG, FZW, and ZIB, directors. W9MZE/DL4CT is rebuilding FJI's rig and also building a 6-meter packset for UMS as pilot model for RACES. PQA has a new beam and added 5 new countries. Those making BPL were TT, NZZ, DDK, and DGA. UQP reports 24 sessions and a traffic total of 207 for QIN. EHZ reports 22 sessions and a traffic total of 222 for CAEN. IFN, reported by EQO, had 52 sessions, morning net traffic 145, evening 190, for a total of 335. Traffic: (Oct.) W9TT 532, NZZ 510, EHZ 388, ZYK 180, SVL 159, JYO 154,

TQC 146, DDK 142, DGA 136, UQP 122, JOZ 116, BKJ 109, WBA 95, EQO 66, VNV 66, SWD 63, UXK 48, CMT 46, KTX 41, WLY 40, HRY 39, ALL 32, NTA 31, WRO 30, PQA 29, AB 24, AZF 24, LGD 23, TG 23, QYQ 22, LIT 21, BDP 18, QBD 17, JBQ 16, ACW 15, FHA 15, NSY 13, STC 13, KDH 11, KDV 11, AQR 10, DOK 10, ZRP 9, AMW 8, WUH 8, AYD 7, CC 6, ZSW 6, PYH 5, GDL 4, QR 4, FJI 3, YVS 2, NH 1. (Sept.) W9WUH 37.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ, and AJU. RMs: IXA and RTP. Nets: WIN, 3685 kc. 7 P.M. daily; BEN, 3950 kc. 6 P.M. daily; WPN, 3950 kc. 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. VBZ has a short beam working FB. SQM needs Delaware and Rhode Island for WAS. GHT is happy with the Q5er on his receiver. There still are several counties without an EC. OVO will welcome your inquiry or suggestions. DIK put up a new 21-Mc. antenna. FFC expects to be back in April of next year. WN9NHE expects to have 65 watts on 144 Mc. soon. RKP is operating a DX QSL card mailing service for outgoing cards. LEV has a new DX-100 on the air. HDV reports that eleven 28-Mc. stations took part in the Green Bay S.E.T. with 16 operators. OVO is enthusiastic over the new Heath Q multiplier he is using. Net certificates (WPN) were issued to KLW, HZO, GYA, and SZR. AJU reports 856 stations QNI into WPN in August with 173 messages handled. MRAC members and the ladies' auxiliary did a bang-up job at the "Do it Yourself" show in Milwaukee, with their radio-controlled tri-cycle the hit of the show. YFW, DGB, FDX, CUW, RH, OPS, LSK, MOT, GWS, HDH, BTM, MDG, WN9VSP, WN9VCB, VBZ, ONY, ABU, ROM, DTK, VOD, UDK, VD, RZD, VBQ, ZNF, WYJ, RUJ, QMA, DQZ, OMZ, KN9BEL, Richard Haskey, Ronald Fedder, Bob Miller, Earl Robertson, Wm. Fullhart, Evelyn Dawson, Anita Thomas, Louise Kaetel, Helene Lindahl, and Irene Buchholz helped to make this a terrific success. KJJ has his 25-w.p.m. Code Proficiency certificate. Officers of the newly-organized Outagamie County Radio Club are VTM, pres.; RNH, vice-pres.; IIU, secy.; KON, treas.; and IVE, act. mgr. Congrats to MQB, who was married Nov. 12th. IIU is rigging his Elmac so it can be used in the car or at home with a minimum of effort. JBF's daughter and XYL are newly licensed in Wausau as KN9BMP and KN9BMQ. Traffic: (Oct.) W9SAA 70, YZA 40, RTP 34, VBZ 22, BVG 20, GMY 20, IXA 16, RQM 14, GHT 12, SQM 12, AJU 10, OVO 9, DIK 7, FFC 7, WN9NHE 2, W9RKP 2, (Sept.) W9BVG 25.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Elmer J. Gabel, WØKTZ — SEC: CAQ. Our new SEC is busy lining up emergency communications and also getting acquainted with his new daughter born Oct. 7th. Congratulations, Doug. Fifteen ECs were appointed in October, making a total of twenty throughout the State. Twenty counties and a few of the large cities are not represented as yet. Bismarck EC GJJ reports a very successful emergency test run Oct. 9th, with KZL directing the assignments of eight or nine mobiles. POT dropped in on his folks for an unexpected visit en route to his new Army base, Fort Belvoir, Va. Don and his sister, KØBEA, called on hams in the Fargo and Moorhead Area. TKS soon will have a new QTH in KH6-Land. Congratulations on the new job, Bob. Traffic: (Oct.) WØFVG 41, KTZ 36, HVA 17, NPR 14, WRK 12, EXO 8, HNV 8, QOB 8, KNØADI 7, WØBFM 6, UBG 6, PMZ 4, KLP 3, VQX 3, CAQ 2, KØATK 1, WØUSY 1. (Aug.) WØWRK 52.

SOUTH DAKOTA — SCM, Les Price, WØFLP — APL, YKY, HOH, GQH, FKE, RMK, TI, MZJ, and GDE will be asked to be SCM assistants to get reports and recommend activities for appointment, beyond those now on the lists for the cities they represent. Send me *radio* reports through them, each month. The 75-meter net elected PRL NCS (evening) and NEO (noon). AEN, Lead ARC president, has been called to a pastorate at Norman, Ill. RSP is active in MARS. Martha, ZWL, has a fine new home and ham shack and runs a fine WX Net. RTD has an NC-98 and AF-67 Elmac. Help SMV get more activity on our c.w. net. SIR is working for Braniff (Dallas). New SFARC officers: RWE, pres.; BYV, vice-pres.; BLZ, secy.; LXQ, treas. KNØBLL, from Omaha, is now in Sioux Falls on 2 meters. The c.w. net (SMV, RM) reports 50 messages in 13 sessions; NEO, NCS of NJQ, reports 20 messages in 24 sessions; PRL, NCS, 32 messages on the 75-meter evening net. Traffic: WØZWL 206, GDE 50, SCT 45, BLZ 38, OII 34, DVB 30, SMV 30, PHR 29, RRN 26, RSP 20, BQS 13, AYD 10, RTD 8, FLP 4.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: KLG and DQL. PAMs: JIE and UCV. A Happy New Year to all of you from all of us. QDP has worked 55 countries so far on 15 meters. MVJ now has a new HQ-140X in the receiving position. SHU has been doing a lot of building for the v.h.f. frequencies. He has an 829-B transmitter for 2 meters and a 2E26 for 6 meters. The new YL club in the Twin Cities now has a name. It is called the North Star YL Club. It meets the 2nd Tue. of every month. KJZ spent two weeks with 4ZDA and ZDS. K6EA is back in Bemidji from California. Army is running into TV trouble. YVA is building a modulator and should be on 40-meter phone soon. VBS has been appointed OO and OBS and transmits ARRL Official Bulletins. VBS has been working some DX such as F8HV, G5JL, I1MQ, and YV5BJ. WVT worked Kurt Carlsen, 2ZXM/MM, while he was in the Canal Zone. PBY is building a 500-watt rig. OJH is working a full kilowatt. The Mankato Area Radio Club now has forty-three active members and meets on the 2nd Thurs. of each month at the Mankato Airport at 2000 CST. MARC members TZK, TZB, QKA, HUU, BBY, and PBY operated mobile in conjunction with the local CAP squadron in an air-ground search problem. ALW is now running 180 watts on 75 and 40 meters and 60 watts on 10 meters. Traffic: WØWVO 250, KLG 159, QHS 137, RLQ 116, MVJ 75, VEP 73, KJZ 60, TKX 51, IRJ 47, WMA 40, VBD 38, VRK 36, BUO 34, MXC 29, QNY 29, LUX 28, VPZ 28, ALW 21, GTX 20, UCV 20, WDZ 19, RVO 18, OSJ 17, LST 14, QDP 13, TCF 13, AUK 10, BZG 10, KNR 9, LIG 8, UMX 8, UBD 6, DYC 4, IIW 4, VEZ 3, K6EA 2, WØFGP 2, GGQ 2, QVR 2.

DELTA DIVISION

ARKANSAS — SCM, Owen G. Mahaffey, W5FMF — WUM reports the Southeast Amateur Radio Club has a new club room, also a new 600-watt transmitter. The Club has applied for a club license, and has a code class on Wed. nights. TID has a 40-meter mobile rig. AAI is the new EC for Pope County. YZI reports the Ozark Academy now has a club room and is ready to install a radio station. TIA has a 50-watt mobile rig on 50 Mc. using a Harvey-Wells TBS-50 and Gonset converter. We are having more activity on the nets and more station activity reports, thanks to all. Hope you can keep it up. Traffic: W5FMF 32, SXM 27, NKH 15, TAI 14, VAA 14, CWC 12, DAG 8, TID 7, JZL 5, ZJI 4.

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — YSN still is having trouble with the new final. GFW is on 40 meters with 100 watts. The New Orleans Radio Club had an election of officers recently. The new officers are IIM, pres.; QPS, vice-pres.; DZV, treas.; YBE, secy. YBE incidentally is a YL, works 40-meter c.w., drives a Cadillac, and is pretty, too. TFQ finally beat down a very bad case of TVI. The Ouachita ARC installed and operated an amateur radio station at the Ouachita Fair on Oct. 14th, using emergency power. The set-up was in connection with civil defense. TST is planning on going aeronautical s.s.b. K5FFA monitors the Yankee Net all day on 7290 kc. A service engineers' meeting held in New Orleans recently by Motorola was attended by APX, ODE, OSQ, IIE, MFH, VEU, FMO, and others. SPZ is back in New Orleans after a three-week tour of duty at Navy's NSS near Washington, D. C. CEW still is hunting DX on all bands. TKV is active as NCS for Louisiana MARS. FMO is trying out a half-wave antenna on 75 meters because the vertical skips too much. Very few reports were received this month, making it pretty hard to get a decent column. It would be appreciated if you fellows would send in information early. Traffic: K5FFA 364, W5MXQ 130, NDV 77, EA 33, UGJ 29, BMD 4.

MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — SEC: PFC. RM: WZ. PAM: JHS. The Hurricane Net, which meets on 3935 kc. daily, now has a special single sideband roll call, daily, which meets on 3925 kc. at 1730 CST. Many more Mississippi hams have joined the s.s.b. group and EWE is one of the latest. Participation in the CD Parties is on the upgrade, with one station reporting a contact with 1BDI. We finally have moved our business into the new location, our new QTH is almost ready for moving in and by the time you read this we should have our new shack in full operation. We sincerely appreciate the understanding you all have shown while we were practically off the air. All certificates pending and applications will be processed and mailed as soon as the desk and supplies are moved and unpacked. A Very Prosperous and Happy New Year to each and everyone. Traffic: W5JHS 43, EWE 29, KNA 6, WZY 2.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. New C.W. Net certificate holders include EIN, VKW, LNN, OKQ, and K4BCV. ZBQ, operating from a rearranged shack with a revamped transmitter, reports the Knox County 6-meter Net is in operation. FEP reports that 12 stations are on 2 meters in the Maryville-Alcoa Area, most of them using ARC-4 gear. TZD had a well-deserved rest in October. New OBSs include TIG and TYW. EWC and TIG are OOs. TYW also is OPS. UVP reports that K4ARZ transferred to Greeneville and YID to Greensboro, and CHB and BBD are proud owners of DX-100s. JVM says Chattanooga ragchews are being held nightly at 2100 EST, with 7 stations present. PFP, our fine PAM, reports much activity on TPN. Congrats to UWA — he has *two* rigs working at once! Al says he is getting good reports on 160 meters with 10 watts. On skip nights, look for TN on 160 meters, ramrodded by RM WQW and HIH. WQT scored 73,975 points in the CD Party! PVD reports APD, UWA, WXL, ZJY, SZE, PNG, SGU, PVD, and KN4BWQ took part in a successful S.E.T., with 77 points. WQT writes that GEN

(*Continued on page 86*)

WHEN something especially nice happens, I guess it's human nature that prompts us to tell others about it. Such is the case this Happy New Year, 1956, when we welcome an old friend back to Hallicrafters after an absence of several years.

Cy Read, W9AA, has been appointed Director of Amateur Relations and eagerly awaits the opportunity to serve hams throughout the world. His first offering appears on this page.

73, W. J. Halligan W9AC

"The Good Old Days"

THE recent celebration of ARRL's 40th Anniversary brings to mind many fond memories of those early days which, to the old-timer, always seem crowned with a golden halo. Time mellows all our memories and it is quite natural to recall the thrills of our first amateur contacts and to forget the difficulties and limitations. However, an unbiased look at what it was really like should be encouraging.

WE ARE all inclined to regard the period of our first experiences in amateur radio as "The Good Old Days" and to feel that any change must be for the worse. Some of us go to ridiculous extremes. The first transmitting equipment ever used at 9AA (spark coil, glass plate condenser and helix) was purchased from an amateur who quit the game in despair when the new Radio Law of 1912 forced him to get off of 800 meters.

DEALERS handling "wireless" supplies and equipment were few and far between; factory-built gear was pretty primitive and plenty expensive, and most of us had to "roll our own". There was no ARRL Handbook, no *QST*, and reliable information was almost unobtainable. A few of the more experienced and well equipped amateurs managed to work considerable distances; but the majority of beginners were happy to get a few local contacts. Spark telegraphy was the only form of transmission; for all practical purposes we were all on one frequency (theoretically 1500 Kc.) and receiver selectivity wasn't even a rumor.

COMPARE that situation with what we have today . . . Excellent factory-built equipment, parts and supplies available everywhere, the best technical know-how costing only the price of a Handbook, and the youngest novice working distances which would have been record-breaking 40 years ago. Amateur frequency bands range from 1800 Kc. to the top of the spectrum, and we operate on CW, AM, FM, NFM, SSB, RTTY, FAX, and even TV if we wish. You think we have QRM today — you should have tried spark in the early Twenties. You have observed a slight coolness between the AM and SSB boys — you should have been around when Spark and CW were battling it out with no holds barred.

MAKE no mistake — "The Good Old Days" were wonderful, and we wouldn't have missed them for anything; but the present, with ever-improving operating techniques and equipment, is even more wonderful . . . The future of amateur radio offers unlimited promise.

WE at Hallicrafters are doing our best to make that promise come true.

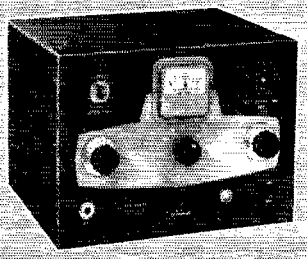
— Cy Read, W9AA

Director of Amateur Relations for **hallicrafters**

I'M FOR THE VIKING "ADVENTURER"...

the best novice transmitter I've found yet!

...says
Larry Kiyabu
WNØWWE



VIKING "ADVENTURER" CW KIT

Compact, completely self-contained 50 watt transmitter kit. Single knob bandswitching—effectively TVI suppressed. Easy assembly by novice or experienced amateur. 80, 40, 20, 15, and 11-10 meters.

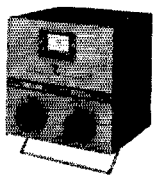
Cat. No. 240-181-1 Viking "Adventurer" Kit complete with tubes, less crystals and key..... **Amateur Net $54.95**

VIKING II TRANSMITTER

180 watts CW input... 130 watts phone. Bandswitching on all amateur bands from 10 through 160 meters—effectively TVI suppressed—completely self-contained. Available as a kit or completely wired and tested.

Cat. No.		Amateur Net
240-102-1	Viking II Transmitter Kit, with tubes, less crystals, key, and mike.....	$279.50
240-102-2	Viking II Transmitter, wired and tested...	337.00

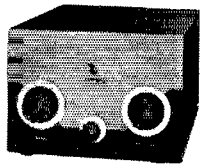
VIKING VFO KIT



Variable frequency oscillator with 160 and 40 meter output for frequency multiplying transmitters. Accurately calibrated 160 through 10 meters. Available as a kit or wired and tested.

Cat. No.		Amateur Net
240-122-1	Viking VFO Kit, with tubes.....	$45.50
240-122-2	Viking VFO Kit, wired and tested..	69.75

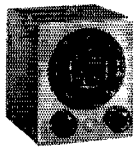
VIKING 250 Watt "MATCHBOX"



Performs all loading and switching functions required in medium power stations. Fully shielded—covers 3.5 to 30 mc. Built-in transmit/receive relay.

Cat. No. 250-23 Viking 250 Watt "Matchbox", assembled, wired, and tested.....**Amateur Net $49.85**

2 METER VFO



Exceptionally stable, temperature compensated, and voltage regulated. Designed to replace 8 mc crystals in frequency multiplying transmitters. Only 4" x 4½" x 5".

Cat. No.		Amateur Net
240-132-1	Viking 2 Meter VFO Kit with tubes and pre-calibrated dial....	$29.50
240-132-2	Viking 2 Meter VFO wired, calibrated and tested—with tubes.	46.50

SWR BRIDGE

Provides accurate measurement of SWR for effective use of low pass filter and all antenna couplers.

Cat. No. 250-24.....**$9.75**

TELEGRAPH KEYS

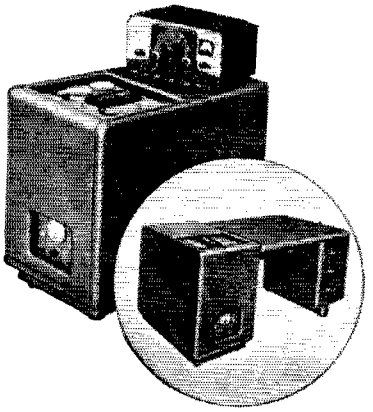
Semi-automatic, high speed standard, heavy duty and practice keys. Code practice sets, cords and wedges for semi-automatic models.

E. F. JOHNSON COMPANY

2801 SECOND AVENUE SOUTHWEST • WASECA, MINNESOTA

See your distributor

Johnson Amateur Equipment is sold only through Authorized Johnson Distributors—most offer convenient time payment plans. For complete information see your distributor.

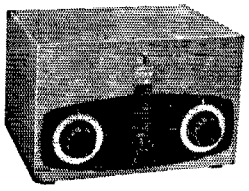


VIKING KILOWATT POWER AMPLIFIER

1000 watts AM, CW, or SSB. Boldly styled . . . contains every conceivable feature for safety, operating convenience, and peak performance.

Cat. No. 240-1000 Viking Kilowatt Power Amplifier—wired, tested, complete with tubes.....**Amateur Net $1595.00**

Cat. No. 251-101-1 Matching Accessory Desk Top and three drawer pedestal.....**FOB Corry, Pa. $123.50**



VIKING KILOWATT "MATCHBOX"

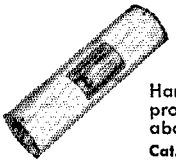
Bandswitching—completely self-contained. Covers 80 through 10 meter amateur bands. Fully shielded—performs transmission line matching and switching functions at the kilowatt level.

Cat. No. 250-30 Kilowatt "Matchbox", assembled wired, and tested.....**Amateur Net $124.50**

POWER REDUCER

Permits 100-150 watt transmitters such as Johnson Viking, Collins 32V or others, to serve as exciters for Johnson Kilowatt. Shielded—up to 20 watts dissipation.

Cat. No. 250-29
Amateur Net $13.95



LOW PASS RF FILTER

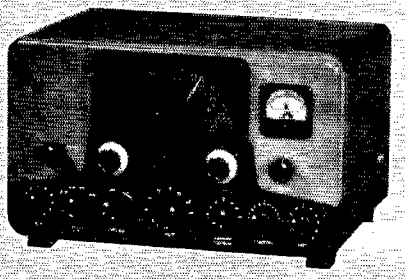
Handles more than 1000 watts RF—provides 75 db or more attenuation about 54 mc.

Cat. No. 250-20.....**$13.50**

I BOUGHT THE VIKING "RANGER"...

more transmitter for the money!

...says
Paul Castrodale
WØFTN



VIKING "RANGER" TRANSMITTER

75 watts CW input . . . 65 watts phone. All amateur bands from 10 through 160 meters. TVI suppressed—built-in VFO or may be crystal controlled. Timed sequence (break-in) keying system. Available as a kit or completely wired and tested.

Cat. No.		Amateur Net
240-161-1	Viking "Ranger" Kit, with tubes, less crystals, key, and mike	$214.50
240-161-2	Viking "Ranger", wired and tested	293.00

E. F. JOHNSON COMPANY
2801 SECOND AVENUE SOUTHWEST • WASECA, MINNESOTA

See your distributor

Johnson Amateur Equipment is sold only through Authorized Johnson Distributors—most offer convenient time payment plans. For complete information see your distributor.

New HEATHKIT DX-100 PHONE AND CW TRANSMITTER KIT

MODEL DX-100

Shpg. Wt. 120 lbs.

$189.50

Shipped motor freight unless otherwise specified. $50.00 deposit with C.O.D. orders.

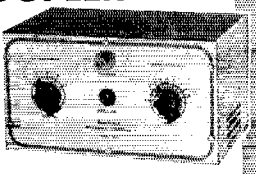
- **R.F. output 100 watts Phone, 125 watts CW.**
- **Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.**
- **Crystal or VFO operation (crystals not included with kit).**
- **Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.**
- **Treated for TVI suppression by extensive shielding and filtering.**
- **Single knob bandswitching, 160 meters through 10 meters.**
- **Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.**

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, ... 125 watts C W. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver I_P Final I_G, I_P, and E_P, and Modulator I_P. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20¼" W x 13¾" H x 16" D.

Heathkit ANTENNA COUPLER KIT



Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

MODEL AC-1

$14.50 Shpg. Wt. 4 lbs.

Heathkit GRID DIP METER KIT

MODEL GD-1B

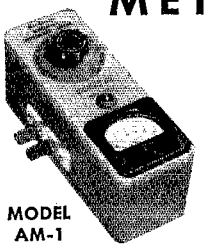
$19.50 Ship. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1¼ meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at $3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

Heathkit ANTENNA IMPEDANCE METER KIT



MODEL AM-1

$14.50 Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100 μa. meter employed. Covers the range from 0 to to 600 ohms. Cabinet is only 7" long, 2½" wide, and 3¼" deep. An instrument of many uses for the amateur.

HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.

BENTON HARBOR 9, MICHIGAN

New Heathkit VFO KIT

MODEL VF-1

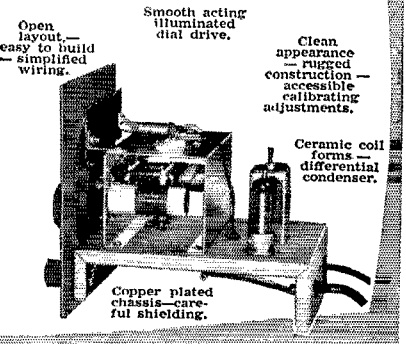
$19.50

Ship. Wt. 7 lbs.

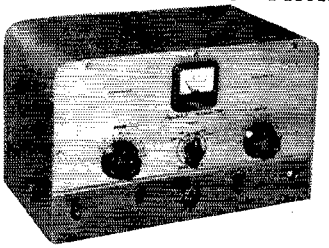
- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard ½" crystal holder. Construction is simple and wiring is easy.



Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

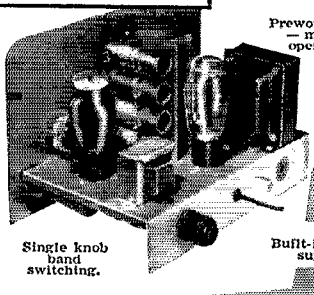
$29.50

Ship. Wt. 16 lbs.

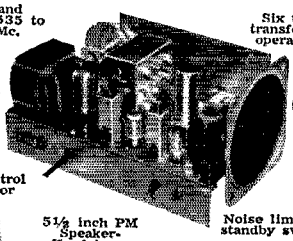
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 .....Oscillator-multiplier.
6L6 .....Amplifier-doubler
5U4G ..... Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8¼ inch high x 13⅛ inch wide x 7 inch deep.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

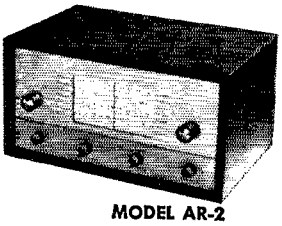


Heathkit COMMUNICATIONS RECEIVER KIT



SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ....B. F. O. oscillator
12AG6.....Beam power output
5Y3GT .....Rectifier
105-125 volts A.C. 50-60 cycles, 45 watts.



MODEL AR-2

$25.50

Ship. Wt. 12 lbs.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

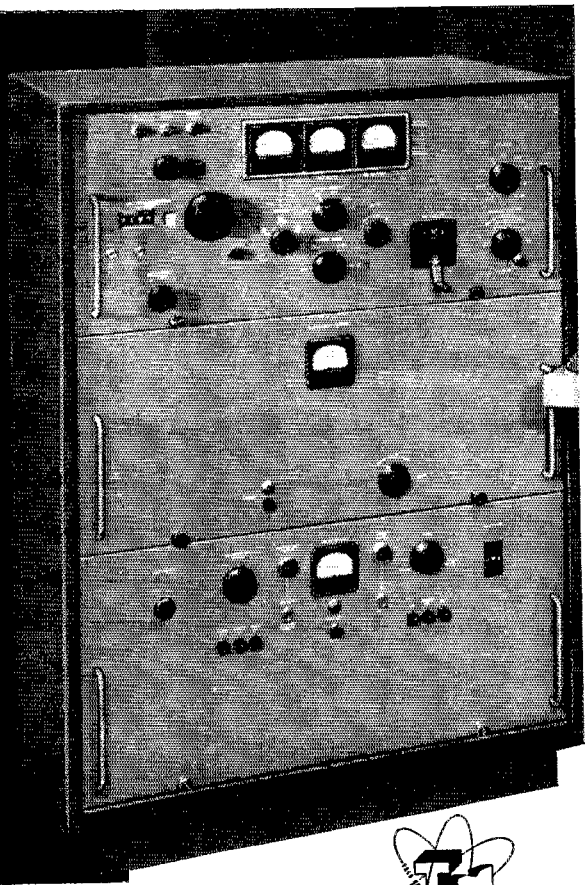
CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

HEATH COMPANY

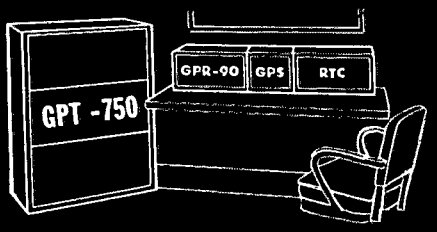
BENTON HARBOR 9, MICHIGAN

THE TECHNICAL MATERIEL CORPORATION, and TMC CANADA, LIMITED, have for many years been engaged in the manufacture and sale of high quality precision communications equipment such as, high stability direct reading oscillators, radio teletype frequency shifters and converters, broadband transformers, tone telegraph systems and diversity and fixed tuned receivers. Millions of dollars worth of this equipment is in use in twenty or more countries throughout the world.



YOUR COMPLETE

Here for the first time is a complete package - every item necessary to go on the air A1, A2, A3 except the antenna and that is in the works right now.



GPR-90 RECEIVER

- Six Bands - .54-31 mc., AM, CW, MCW, FS.
- Full Electrical Bandspread and Main Tuning.
- Antenna matching with Ferrite Transformer. 75 ohm unbal. and/or 300 ohm bal. inputs.
- One Microvolt Sensitivity or better for 10-1 Signal to Noise Power Ratio.
- Selectivity in 6 Steps, Variable, 200 cy. to 5 kc. 5 Crystal, one non Crystal.
- Hum Level - Better than 60db down. Image Ratio - Better than 60db.
- Exclusive Audio Selectivity Control.
- SSB coaxial IF output and Audio input.
- Diversity Operation with GPR-D. HFO, BFO, IFO External Controls.
- For Complete Details Request Bulletin F-179B.

FCDA
APPROVED
GPR-90
GPT-750

EQUIPPED HAM SHACK

GPT-750 TRANSMITTER

- Full KW - input phone, or A2 or A1.
- Continuous Frequency Coverage 2. to 32 megacycles.
- Completely Bandswitched.
- High Stability Direct Reading V.F.O.
- Pi-network Output.
- TVI Suppressed
- Coax Output 30 to 140 ohms.
- All Decks on Slides for Easy Servicing.
- Double Blower Pressurized Cabinet. Fiberglass Filters.
- Interlock Protected - Overload Protected.
- P.S. Available on Request.
- Final Available for SSB Operation.
- For Complete Information Request Bulletin F-174A.

RTC REMOTE CONTROL AMPLIFIER

- Modulation Indicator.
- A1, A2 (tone), A3 Emission Control.
- Peak Clipping Amplifier - Clipper Adjustable 0 to 20db.
- Modulation Control.
- Keying and Monitor Jack.
- Push-to-Talk Mike Input.
- Receiver Muting.
- For Complete Information Request Bulletin F-183

THE TECHNICAL MATERIEL CORPORATION

OTTAWA, ONT., CANADA

MAMARONECK, NEW YORK.

(Continued from page 78)

has installed an Alternator in his mobile, and 6TED/4 is building a 600-watt mobile s.s.b. rig! WQW also reports that TN had an average QNI of 14, with high traffic of 30, and total of 183 for the month! Flowers to OEZ, Davidson County EC, for his fine bulletin and report on that very active net. The Memphis Club had 42 Memphis hams participate in the S.E.T., handling 55 messages. The Memphis 6-meter Net now includes BAQ, NMM, LVS, TIZ, and K4DBQ on 50.5 Mc. at 2000 CST Mon. Traffic: W4VNE 155, IIB 135, WQW 102, TZD 96, PFP 95, OGG 83, TYW 67, HIH 62, YMB 49, TIE 48, VJ 46, PQP 44, SKH 40, RRV 39, UVP 31, JVM 30, PAH 28, UWA 23, CXY 19, WQT 17, SCF 16, PYD 14, K4BCV 13, W4BAQ9, HUT 8, FEP 5, HSX 5, DCH 4, UVL 4, HLR 2, ZBQ 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — SEC: CDA. PAM: YYI. RM: KKW. The PAM reports for KPN as follows: 31 sessions, 432 total call-ins, 13.9 stations per session, 46 total traffic, 1.5 messages per session. The RM reports as follows for the KYN, combining the A.M. and P.M. nets: 75 sessions, traffic total 225, average 3 messages per session, 37 active stations throughout the month. HSI has bought a new Spartan trailer home, and must be getting ready for some more gear. CDA says he finally got the 813s tamed again. K4AGT has his mobile rig in now so we may be hearing some signals coming from down the road. Sorry to learn that VHU's wife passed away. BAM still is burning the leaves off the trees next to West Virginia. The team of ZDA and ZDB sure are doing a nice job on the nets now and with a big hefty signal, too. AZQ is hunting a transformer for his HT-9 so he can get back on at Ashland. Traffic: W4QCD 227, KKW 135, ZDB 99, ZDA 85, RPF 69, CDA 63, HOJ 46, SBI 30, ZLK 29, SUD 27, JP 20, NIZ 20, WBB 20, JCN 14, K4AGT 11, W4IAY 6, SZB 6.

MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM (c.w.): Joe Beljan, 8SCW; Asst. SCM ('phone): Bob Cooper, 8AQA. SEC: GJH. Here we go into a nice new year so I'll take this opportunity to express my thanks to all of you for your coöperation and assistance through '55 and extend my best wishes to all for a happy and successful '56. This is a great hobby. Let's all make an effort to make it even better this year by putting just a bit more into it. The return will be worth the effort expended. We might do well to look over our activities of the past year and see what we can do during this one. How about making a goal of starting at least one new ham on the road to hamdom? There are many ways to promote the hobby and at the same time reap individual benefits. At this writing we have two stalwarts on the road to recovery. WXO is out of the hospital, as the traffic totals show, and he has asked me to extend his thanks to all for the many cards and messages that he received. HSG has been QRT with a heart condition and is getting back to normal in the usual time. We all wish you both the best. FX is back among the active from his new QTH and is ready to pile up the totals without old demon noise that has plagued him for so long. QIT now has twenty-five new countries with his new beam which was described recently. Both WGU and HIM say that 6-meter activity is picking up in their areas. The Grand Rapids gang has been working many months on the convention plans and they say that this one for '56 will be bigger and better than any to date. This we can believe from past results. They are certainly deserving of all the praise we can offer. All of the section members benefit from their work. APL, AYY, HPR, and SPF participated in the September F.M.T. with excellent results. HPR was tops with an accuracy of eight parts per million error. Congratulations to all. HKT has his 2-meter converter converting but doesn't have the transmitter on the air as yet. Traffic: (Oct.) W8ELW 157, ZLK 119, NUL 118, ILP 109, FGB 71, MPD 65, QIX 58, IKX 54, NOH 50, QQO 47, SIB 47, WGU 45, RAE 27, PHM 20, RVZ 20, TIJ 20, AUD 18, JYJ 14, IUJ 13, DSE 11, HKT 8, WXO 4, DLZ 3, TQP 3, WVL 1. (Sept.) W8TQP 17, QZR 4.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; E. F. Bonnet, 8OVG. SEC: UPB. PAMs: EQN and HUX. RMs: DAE and FYO. New appointments include CUI and RVU as ECs; AGZ and ETU as OBSs; HDA as ORS; and ETU as OO. WE has returned to the air at his new QTH. QXH has purchased a Viking I with matching VFO. ØVBS would like to schedule Toledo stations on 7-Mc. c.w. so as to make his WTO. NAF has built a six-element director beam as described in April 1955 *QST*. SPU has a new 75A-4. She is RO for Wyandotte Co. FNW and GOZ are new Novices in Mt. Vernon. OUZ has a DX-100. NTP has a new 20-meter beam. Thirty-eight people from five Ohio cities attended the Tiffin club meeting Oct. 17th and saw the movies of the FO8AJ Clipperton Expedition. The new name of the Tiffin club is the Seneca Radio Club. FYW is the new Communications Officer for the State of Ohio Civil Defense. The West Park Radiops will present loving cups to its highest scoring phone and c.w. stations in the 1955 Sweepstakes. The Dayton *RF Carrier* informs us that they are sponsoring a Hamvention QSL Contest; PLQ transmits ARRL Bulletins on Tue. at 2130 on 144,450 kc.; JAR is attending Tri-State College; KDY is the club's new TVI chairman; IKH has been called into military service; and MGW is in the Navy at Great Lakes, Ill. Springfield's *Q-5* reports that new officers are LAB, pres.; HOK, vice-pres.; DCJ, secy.; OKB, treas.; and JRG, editor. Committee heads are JNU, membership; OKB, contest; BFP, programs; WXG, educational; and OG, interference. The club has put up a nice prize for high Sweepstakes scorer. The Hocking Valley bulletin states that JAP and JAO are father and son; RRQ has a new SX-100; WN8FCO worked into Texas; VSS passed his Technician Class exam; and new club officers are CRS, pres.; HPP, secy. and treas.; and VSS, vice-pres. Cincy's *Mike and Key* reports the untimely passing of NDA. OVARC's *Ether Waves* states that JIN is the Club's over-all DX champion. Numerous prizes and a special trophy will be presented to the Club's outstanding Sweepstakes operators. The OVARC DX column has grown into an outstanding article. The Columbus *Carascope* did not arrive this month although we understand that the CARA's membership is on the increase. The Cleveland CWA held a shindig on Dec. 10th. The Fort Hamilton *Feedline* reports that UFF won the club code receiving championship; STQ has built some new 2-meter equipment which is ready to go; and the annual auction was held on Nov. 3rd. The Toledo *Shack Gossip* relates that KIX is in the Navy; BBO and HUX recently celebrated their silver wedding anniversary; CQW is a new Novice in Sylvania; the MVEs have a new daughter; and RZN is specializing in African violets. As per usual, a tempting recipe is included in the bulletin. Eastern Ohio's *Ham Flashes* lets it be known that JHB and UYB are attending M.I.T.; DOY won a scholarship at A.T.E.S.; ANM was reëlected president of the Falls Radio Club; JIF and HRV are conducting radio classes for the East Palestine Club; NDB is president of the Warren High Radio Club; SSF and SSD, Akron, are on the 50-Mc. band a total of 18 hours per day; and ETV and LQZ are attending Miami U. Traffic: (Oct.) W8UPB 234, DAE 154, VTP 131, IIR 116, AJH 88, OPU 79, RO 44, AJW 39, AMH 35, WAV 32, AL 31, HUX 30, MQQ 26, HPP 25, SUI 22, CTZ 20, PZS 20, PLQ 10, CVZ 9, EEQ 9, ET 9, HFE 9, DCJ 8, GZ 8, QXH 8, NZC 7, RN 7, STR 6, ARO 5, AYR 5, HZJ 5, MGC 5, BEW 4, ILC 4, INW 4, NTP 4, ODS 4, ZAU 4, EQN 2, ILE 2, LMB 2, MXO 2, RNL 2, HNP 1, MYV 1, USU 1. (Sept.) W8ZAU 24, GZ 11, HNP 11, SPU 6.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: K2BJS and TYC. PAMs: GDD and IJG. During the past four years it's been my pleasure to serve as your SCM. With the help of our fine group of leaders and all of those interested, our Eastern New York section has grown to be one of the outstanding sections in the ARRL field organization. Our AREC, under the leadership of SEC RTE and with the help of Asst. SEC LEL, has grown and continues to progress. I am sure that all of you will share in my offer of sincere thanks and congratulations to these gentlemen for a job well done. Although it's been a pleasure and a happy experience for me to work with you, I regret that because of my work, which during the past year required that I move to a different part of the section and at present temporarily to another state, I feel that I can no longer serve as your SCM after the expiration of my present term. I trust that when your new SCM takes office that in the interest of this fine section he will have your full support. My best regards to all of the clubs and continued success. A cordial welcome to K2PPB, ex-W1DXS, of Worcester, Mass. Dave is now located in Larchmont and is active on the traffic nets with a Viking Ranger. K2EDH enjoyed his first CD QSO Party. Jon is ORS and active in NYS and 2RN. K2HLL, the Peekskill Radio Club, held its annual auction recently and VGI reports that it was a great success. Taking part in the recent F.M.T. were CFU with an average error in two measurements of 18.1 parts per million and CTE with an average in two measurements of 10.3 parts per million. Traffic: K2PPB 90, JEQ 13.

NEW YORK CITY AND LONG ISLAND — SCM, Harry J. Dannals, W2TUK — SEC: ADO. PAM: NJL. RM: VNJ. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. at 1915 EST; NYSPETN, 3925 kc. daily at 1800 EST. New appointments: JKX and WUQ as ECs. ADO and K2ECY as OBSs. The NLI AREC Net meets tentatively at 10 A.M. Sun. on 3630 kc. Contact ADO and WFL for details. This is a good chance for the Section ECs to get together. WFL reports 29 different stations reported into NLI handling 153 messages. The Net is looking for still more business. JIL is the new ARRL QSL Manager for the second call area, replacing SN. All W2s, K2s, and SWLs are requested to file envelopes with Frank at Box 62, Station P, Brooklyn 12. The Nassau 10-meter AREC mobiles, under ZAI, assisted police in the search for a lost boy in E. Meadow. Actively participating were fixed stations BHJ, CRT, CXI, DFL, VL, ZAI, and K2CJF. Mobile stations actually engaged in the search were K2HMV, as con-

(Continued on page 98)

MALLORY HAM BULLETIN

MALLORY 6-Volt Battery Charger Keeps Mobile Unit on the Go

Those of us who have tried mobile operation are fully aware of the very difficult problem of how to keep the car battery charged adequately for starting purposes, and still provide plenty of juice for a reasonable amount of time on the air.

Recently, one of our good amateur friends, who is a red-hot mobile fan, told us of a method he used for keeping his battery at top performance and still add no extra equipment to his automobile. His system sounded so practical, that we'd like to pass it along.

Here is what he did. First, he visited his Mallory distributor and bought a small, inexpensive Mallory 6-volt Battery Charger (the 6SAC6 or 12SAC5 for 12-volt systems) together with a special automobile Cigarette Lighter Plug (Mallory R675) to be used for inserting the Charger output into the electrical circuit of his car. The Lighter Plug was attached to the Battery Charger and the whole business was then mounted conveniently in his garage.

After an evening of mobile operation, he simply inserted the Plug into the cigarette lighter socket, turned on the 117 VAC line, and the next morning, presto, his battery was ready for heavy starting action.

With this very convenient arrangement, this ham was able to operate his mobile rig the year 'round, with little fear of even tough wintertime starting.

Incidentally, if your car is not equipped with a cigarette lighter, don't let that handicap you, simply ask your distributor for a Mallory Dashboard Receptacle (R652) which may be clamped to the dashboard without drilling a single hole. Used in conjunction with a Cord Assembly (R670) this arrangement will provide all the convenience afforded by the lighter plug method of installation.

P. R. MALLORY & CO. Inc.
P.O. Box 1558
INDIANAPOLIS 6 INDIANA

P.R.MALLORY & CO. Inc.
MALLORY

(*Continued from page 49*)

Hallicrafters adds to the above: We, through W9CYD in Chicago, started a code class at our plant in the fall of 1954. In approximately February of 1955 the class was transferred to Allied Radio. W9CYD is again running the class at our plant this year and Allied is conducting another class. The locations are sufficiently distant from each other to cause no conflicts. — *Fritz Franke*

Washington Radio Club (D.C.): Our class started out with about 18 pupils, ¾ of them teenagers. We began in October of 1954 and 12 of them had received their Novice licenses when we stopped during the last week in May of 1955. Our classes were held once a week at a not-too-convenient location — a recreation center. The teen-agers were about junior high age, one of them being only 11 years old. Several YLs started out but gave up because of the location. We hope to continue this fall to prepare the Novices for their General licenses. Theory instruction was by W3ECP, with code by W3CDQ, W3VBP, and W3WAG. — *W3CDQ*

Central Illinois Radio Club of Bloomington, Inc.: We finished our code and theory class in early August and out of a total of 35 that started the 15-week stint (one night a week), 7 finished. Four took the exam under our supervision and the other three sent in for their papers but did not get them in time to take the exam on the date set. From my observations, too many students think it's a snap at the start and you soon lose them. However, those left at the final stages of the class are the ones whom we want on the air anyway. One of our finishers was a boy of 12 and we are rather proud of the way he dug in and went after his ticket. He mortgaged one of his hogs to his Dad to get money to buy a receiver last fall, so it wasn't surprising to see him work for his ticket! — *W9SXL*

West Park Radio Ops. (Ohio): Classes are held every Tuesday night from 7 to 10 and anyone is welcome. There are usually about 8 persons in the class but we can easily accomodate 20. The ages are from 15 to 50. The length of time to obtain General Class licenses varies from 6 months to two years with the teen-agers getting there most rapidly. We meet in my basement to give the students opportunity to get acquainted for more practice, to keep up interest by talking ham radio, etc. I've been teaching code and theory to would-be amateurs for over four years and over forty have obtained their General Class licenses. — *W8DOG*

G.E. Ham News: While the G.E. Tube Department has not directly sponsored a training class, we recently supported a very effective Novice amateur class conducted by Fort Orange Radio Distributing Company in Albany, New York. We have several pamphlets and booklets available relating to basic electronic tube and radio theory along with quantities of most back issues of *G. E. Ham News* that may be helpful in conducting these classes. We plan to make literature available to any radio parts distributor or radio club that wishes to sponsor a class of this type. Also, we are having printed a QSL card based on the ARRL Log form which we have suggested might be useful as a graduation present for Novices successfully passing their FCC examinations. — *W2JZK, Editor*

Lakeland Amateur Radio Society (Fla.): Our latest class began in January of 1955 and was planned to run six weeks but actually ran two months, a concentrated course for Novice Class examination only. Our enrollment was 17, but that settled down to about 12 regular students, three of them women. The ages ran from 12 to 55. Out of this number, 6 obtained their Novice tickets and are well on their way toward obtaining General Class licenses. Instructors sharing the work load were W4BJI, W4UDB, W4VIE, W4YKR and K4AGH. In the past we have run a longer course for General Class exams but have found that the short course gets much better results. Once a person obtains a Novice ticket, he can handle it from there himself. Dates for our next class aren't definite; however, we will have one, probably beginning in January of 1956. It will be another Novice course (meeting twice per week, probably on Monday and Thursday evenings). Classes are held in our club house on the campus of Florida Southern College. — *W4ATV*

Portland Amateur Wireless Association (Maine): Informal classes in code and theory were held during the winter of 1954–1955 and spring of 1955 at the club room at 97 State Street, Portland 3, Maine. Through the help of these classes and outside help of members 7 received their Novice tickets and 5 received their General or Conditional licenses. Age groups ranged from 10 to 50 years. Classes are being held during the 1955–1956 season on Tuesdays at 7:30 P.M. in the club room. All licensed club members are called upon to assist with the instructions and thus the load will not be placed upon any individual. Two different groups will be held, one being for the Novices; while code instruction is going on the man giving theory will teach the members studying for their General Class. Immediately following that session, code will be given to the General Class and the Novices will get their theory. — *W1BBB*

Eimac Amateur Radio Club (Eitel-McCullough, Inc., San Bruno, Calif.): The Eimac Amateur Radio Club conducted a code class from June 23 to July 28, 1955. Classes were held on Monday and Thursday evenings at the home of W6FYM with W6GVY assisting with instruction. Eight men and W6GVY's ten-year-old daughter enrolled in the course, but conflicting dates made it necessary for all but three to drop out. The class used the recorded Army instruction course and considered it highly successful. — *Berkley Baker*

Lancaster Radio Transmitting Society (Penna.): Our 1955 classes started February 9th and ended on March 30th. The initial enrollment was 28 with 18 obtaining licenses. The age group was 14 to 60 with a ratio of 27 males to one

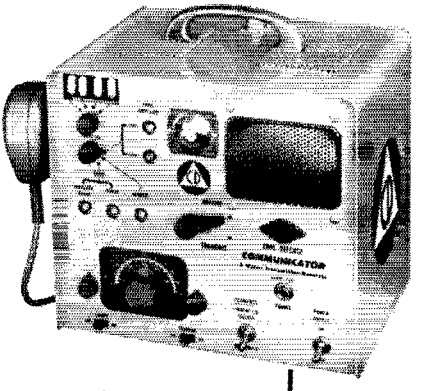
GONSET FCDA APPROVED

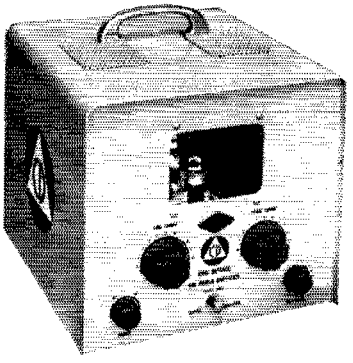
Communicators

Now Communicator models for 2 and 6 meters approved by FCDA. These outstanding models have several added features including provision for four crystals selectable by panel switch. A dynamic-type hand microphone and canvas carrying case are standard equipment.

FCDA 2 meter Communicators.
6V DC/115V AC.....Gonset part No. 3087
12V DC/115V AC.....Gonset part No. 3077

FCDA 6 Meter Communicators.
6V DC/115V AC.....Gonset part No. 3088
12V DC/115V AC.....Gonset part No. 3079





LOOK FOR THE ATTRACTIVE YELLOW CASES

VHF Linear Amplifiers

Now linear amplifiers for 2 and 6 meters approved by FCDA are available for use with companion Communicators to increase power output to 50-60 watts. These FCDA amplifiers are supplied with carrying case as standard equipment.

FCDA 2 meter Linear Amplifier.....No. 3089
FCDA 6 meter Linear Amplifier.....No. 3090

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A COMPLETE LINE OF ANTENNAS AND ACCESSORIES.

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female. We met Wednesdays from 7 to 9 P.M. at McCaskey High School, W3VBI conducting the course. W3VBI stresses that all trainees should do plenty of home practising on both code and theory. During the 16 class hours, 10 hours were devoted to code and 6 to theory with the final session reserved for giving the Novice license examination. We plan further classes at the same location. — *W3OY*

Northern Nassau Amateur Radio Club (N.Y.): The first fundamental question that arose was the problem of what was to be the goal of the course. We decided to make our goal the Novice examination and in planning the course we specifically covered the information required for this type of examination. In addition we went a good degree further and covered much more technical information almost enabling some of the candidates to take the General Class examination.

The only facility available to us for instruction was the Roslyn High School which we could have on Friday nights only from 8 to 10 P.M. (We started our classes promptly at this time regardless of the number of students present. After the first session, the prospective candidates realized that we meant business and came on time to every session.) We felt that for a period of once a week we could not successfully cover the requirements even for the Novice examination. We then suggested that the students study code at home by records, code machines, by helping each other practice, and finally by listening to code-practice transmissions by W1AW, and other stations. As a help, we instituted a 15-minute practice run every week before the class started to enable students to check themselves. In addition, this code-practice run gave us a chance to make sure that all of the students were practising code on their own.

The class started out with a total of 14 students. Of these, 11 were men and 3 were women. Of the 11 men, 6 were of the age level of 12 to 15 years, the other 5 ranging from 19 to 50 years of age. Of the three women, 1 was a youngster in the age group of 12 to 15, the other two were in the age level of 19 to 50 years. Two students dropped out, but we picked up 2 more so we finished the class with the same total, 14. Of this group, 10 took and passed the Novice examinations. The remaining 4 were worried about their code and could not be prevailed upon to sit for the examination. We hope that they will show further interest and finally come and pass the examinations. Instructors were W2CNN, W2YML and W2DUO. — *W2DUO*

Broward Amateur Radio Club (Florida): In 1953 and 1954 we conducted our most successful classes at the home of Mrs. Bette Shepherd, W4ZQQ. The classes averaged about 8 students, in the age group 16–30. I believe about 5 went on to get their Novice tickets out of each class. When we get requests for code instruction, we now invite the persons to our meeting and are able to introduce them into a group running in someone's home. Even though we currently do not have an official club class, we seem to be able to take care of all applicants. — *W4PM*

Ft. Orange Radio Distributing Co., Inc. (Albany, N. Y.): This course was offered free of charge and free of any obligation whatsoever at Uncle Dave's Radio Shack, here at Ft. Orange Radio. New and used equipment was made available for instruction and after the formal classes local amateurs operated the transmitters and demonstrated on-the-air procedures. At the end of the course W2APF gave each participant a membership in the Albany Amateur Radio Assn. as a graduation present.

Ft. Orange received several inquiries from people seeking information on how they could become radio amateurs. We approached officers of local clubs and some individual hams. The question arose as to whether we should be charged with conducting a sales program under the guise of an amateur hobby class. We discussed the matter with the Albany Amateur Radio Assn., then presented a program entirely devoid of advertising or sales approach.

The AARA offered assistance in conducting the classes. W2FEN, an outstanding amateur who has had invaluable experience in teaching, outlined the best procedure to follow and pointed out certain pitfalls to be avoided. He urged us not to limit ourselves purely to license requirements but rather to provide a general background in essentials. The class was announced and registration blanks made available. Our classes began on a Monday evening, with 46 in attendance, 41

The Northern Nassau Radio Club's Novice course draws a good proportion of youngsters, here watching instructor W2DUO.

CHOOSING YOUR CRYSTAL

Remember—Just any crystal and just any oscillator will not combine to produce spot frequencies.

Several facts should be considered other than the frequency. The final oscillating frequency of the crystal is affected by the associated oscillator circuit through the reactive load and drive levels. For close tolerance operation and oven use the ambient temperature also must be considered.

For overtone operation crystal units especially processed for mode operations produce better results than fundamental types. Overtone crystals are calibrated on their overtone frequency and therefore are accurate frequency control units. Overtone crystals are valuable for receiver-converter applications and are normally not utilized in transmitters, since only a small amount of power is available under stable operating conditions.

Oscillator Load—will affect crystal frequency from 100 cycles to several kilocycles depending upon the crystal frequency. International crystals are designed to operate into the loads listed below:

Temperature—All crystals processed by International use "Zero Coefficient" cuts. Blank angles are held to closer tolerance in the F-6 units and therefore will change less over a given temperature range than the FA units. Tolerances are listed in the table below.

TYPE	LOAD CAPACITANCE or OSCILLATOR	CALIBRATING TOLERANCE IN SPECIFIED LOAD	TEMP. TOLERANCE −30°C to +60°C
F-6 (fundamental)	Specified by customer (Use in commercial equipment)	±.0025%	±.002%
F-6 (overtone)	Specified by customer (Use in commercial equipment)	±.0025%	±.002%
FA (fundamental)	32 mmf (only)	±.01%	±.01%
FA (overtone)	Anti-resonate operation without aditional load. (See circuit with crystal)	±.01%	±.01%
FX-1	FO-1A or FO-1B Oscillator	Available from .001% to .01% as required	±.002%

Send for FREE Catalog covering International's complete line. Crystals available from 100 KC to 100 MC.

VISIT - The 8th Annual Southwestern Regional Conference & Electronics Show - I.R.E. Oklahoma City February 9, 10, 11

International CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1165 OKLAHOMA CITY, OKLA.

«

KN2ONR of the Albany Amateur Radio Assn. sends slow-speed code to Novice aspirants at classes held at Ft. Orange Radio Dist. Co.

«

males and 5 females. In age groups, we have 11 under 18 and 35 over. Our youngest student was 12, the eldest was 54. Three mothers came with their sons, as did several fathers.

ARRL furnished many training aids in theory and code. W2JZK, editor of *G. E. Ham News*, furnished manuals on the fundamentals of electricity and colored sound movies of electronics. The General Electric Company also provided engineers from their research departments to talk on various phases of electronics.

Our theory class was conducted by Lew Buono. Lew did an outstanding job in teaching radio fundamentals and made it most interesting with his excellent sense of humor. He conducted several written examinations in the style of the actual examination as he went along and used the results to time his teaching program. Code was taught by KN2ONR who has had many years of experience in teaching a concentrated code class in the Army. Class continued for 9 weeks, from April 11 to June 6, 1955. The class of 46 was reduced to 40 after 3 weeks, with 3 women and 3 youngsters dropping out. Forty people took the exam with 36 passing and obtaining licenses. For those who missed a Monday evening code class we conducted a make-up class on Saturday mornings with records and recorded tape. Speed classes were also conducted at this time from advanced records.

Publicity given to amateur radio during the recent flood disaster has focused additional attention on amateur radio. With the increase of interest, we're planning a fall program of two classes simultaneously run, leading to Novice or General Class license. Incidentally, I wound up by getting tagged with a call myself! — *KN2ONQ*

Manchester Radio Club (Conn.): No accurate records were kept, but I conducted classes from September, 1954, to June, 1955, on a continuing basis for Novice code requirements; beginners at 1930 and advanced at 2000. Thus, when the urge strikes an aspirant there need be no delay. Of over 22 starters, at last reports 11 held Novice licenses, 5 already have made General Class and 3 will continue their studies this fall; the others fell by the way. Aspirants ranged from 10 to about 40 years of age. One young lad of about 12 qualified in five weeks, although the average is about 9 weeks. I ask all to try to find some way to copy code for at least ten minutes daily. We then try to smooth over the rough spots during the class sessions. — *W1SBK*

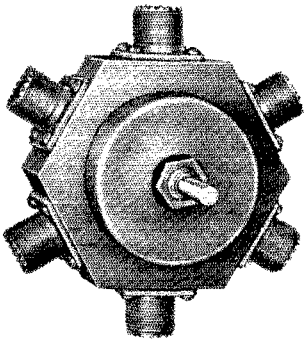
Davenport Radio Amateur Club (Iowa): Our club incorporated with the understanding that no person would be eligible for membership unless he was a licensed radio amateur. However, at that time there was no Novice or Technician grade license. About a year ago we opened club membership to them but with the stipulation that each must have a General Class license within one year or be expelled from the club. Accepting these Novices into the club placed us in the position of having a moral obligation of helping them to secure the General Class license. It was then decided to organize an eight-week class of training based on the questions appearing in the ARRL *License Manual*. WØHMM was selected to organize and instruct the class.

We had no medium of reaching the Novices in our community except through announcements in our local paper. We didn't know who the Novices were or where they resided. The only thing we knew definitely was that there were six and perhaps more of them. The results of the announcements were startling for the reason that not one Novice appeared. However 41 other people did! Investigation showed that none of them knew anything about radio. As I pointed out, we had planned and prepared a course in advanced theory. Within 30 minutes it was necessary to scrap this plan and begin teaching from the very beginning. It was a job but for 8 weeks we floundered along and had the fine feeling that goes with seeing 19 Novice tickets blossom out in our town and having a total of 30 people complete the course.

We suggest the use of visual instructions in every session. Your local library has a catalog of the places where you can secure films and the titles are listed under the classification of radio or electronics or electricity. Lecture first and use your visual aids afterwards. You will find they understand them better. It helps to follow up with a question-and-answer period.

Teach code first; after sitting for an hour and a half, students may be too tired to grasp it.

QUALITY PRODUCTS BY B&W



COAXIAL SWITCHES

These multi-position switches eliminate the fumbling and annoyance of screwing and unscrewing coaxial connections. With the Model 550, you can instantly select any one of five antennas, transmitters, exciters, receivers, and other r-f generating devices using 52 or 75 ohm line just by turning a knob. Handles up to 1 KW of modulated power with a maximum crosstalk of -45 db at 30 mc. Model 551 is a 2-pole, 2-position type for switching various devices in or out of series connection with coax lines.

AUTOMATIC T - R ANTENNA SWITCH

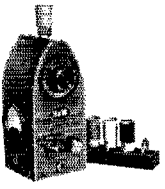
Fully automatic electronic antenna changeover from receiver to transmitter and *vice-versa* — suitable for all power applications up to the legal limit. Model 380 is ideal for voice operated SSB — AM phone and break-in CW —all with one antenna.

ALL OF THESE FINE B&W products are available at leading distributors' everywhere.

MATCHMASTER

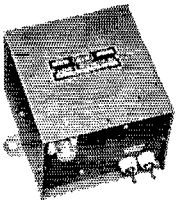
Three valuable instruments in one, the Matchmaster can be used as a dummy load, direct-reading r-f wattmeter, and an integral SWR bridge, for fast measurements on coaxial feed lines, antennas, and transmitting equipment.

DIP METER



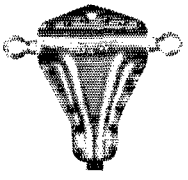
This indispensable instrument serves as a sensitive grid dip meter, signal generator, absorption wave meter, or signal monitor from 1.75 to 260 mc. Saves time in transmitter tuning, neutralizing, antenna loading, etc. Color coded 5 band dial matches five coils supplied.

1 KW BALUNS



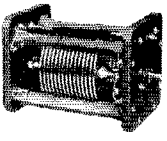
Fill the gap between unbalanced feed lines and balanced antenna loads, provide maximum transfer; low power line radiation on transmission; high signal-to-noise ratio on reception. Models for rotary beam, folded dipole antennas.

COAXIAL CONNECTOR



Permits efficient, watertight, coaxial cable connections for antenna systems. In addition, it serves as a center insulator for a half wave doublet antenna. Ruggedly constructed of aluminum, with steatite insulation, connector withstands a 500 lb. pull.

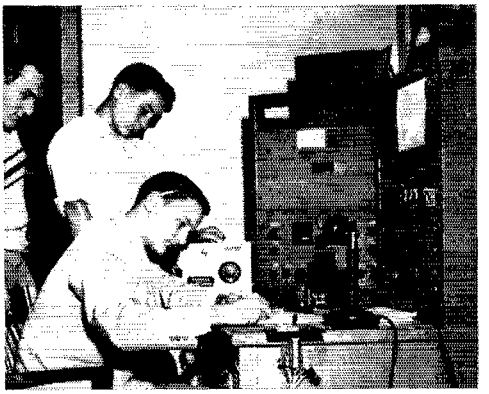
ROTARY AND FIXED EDGEWOUND INDUCTORS



Rugged inductors, useful for high power transmitters, r-f heating equipment, antenna phasing networks, etc. Available in wide range of inductance and current ratings or may be ordered custom built to individual specifications.

Barker & Williamson, Inc.

237 Fairfield Ave., Upper Darby, Pa.



In four years of regular classes, the Middlesex Amateur Radio Club has turned out nearly 600 hams under the guidance of W1SAD. Here graduate W1DLF operates club station W1HEB on the classroom premises.

Have a five-minute break every ten minutes or so. Use the *License Manual* as a basis and the ARRL *Handbook* as an outline if there is any question.

Above all, keep it simple! You'll have ages from 9 to 70. Don't let some smart guy try to take the ball. Explain right at the start that your course is elementary. Always assume the person knows nothing about it or he wouldn't be there. You'll find guys who like to ask 64-dollar questions just to impress the class. Clamp them down quickly or they'll ruin the entire session.

Start prior to Christmas and not later than the second week in April for the finish. Furthermore, don't become discouraged if a few drop out as you go along. Good luck! — *WØHMM*

Adult Education Association (NYC):

General theory courses are offered twice yearly at one of the evening high schools under the sponsorship of the Adult Education Association. During 1954 and 1955 courses were offered both for Novice and General but it was found that with the exception of code, the theory end of the Novice course had too little to offer. The program for 1955–1956 does not include Novice but is restricted to General. As a general rule, because this course is offered in the evening from 7:30 to 10:00, most of the classes have been made up of adults over twenty.

The older the student the greater the problem becomes to refresh his memory on use of decimals as multipliers, factors, divisors, etc. (The youngster, having had such topics rather recently, finds no trouble at all in understanding.) The adult must be trained even to simple forms of multiplying numbers.

A great degree of care must be afforded to avoid the possibility of hurting anyone's feelings. Our practice is to call upon the younger of the group who are hard-shelled in this respect and their apparent lack of knowledge is only another incident in their lives since such is a daily situation in their school classrooms. The adults may "break" for any additional information desired or for clarification.

The adult, probably because of his developing solutions to his economic and social problems, has acquired a need for an explanation in detail so that he might comprehend fully the significance of the structural as well as the theoretical analysis of the work. He is not willing to accept "as such," and finds great difficulty in making an attempt at straight memorization. The adult in amateur radio seems to require far more "Why does it work" than does the youngster.

The boys from 14 to 18 are great mimics and have unusual ability to memorize even though they are unable to explain what they have memorized. It is surprising as to how many are capable of repeating almost word for word the answer to the question in the *License Manual* on the mercury-vapor tube and yet are unable to explain any portion of their answer to show that they understand.

Even more surprising is the ability of musicians to acquire code. One young lady went to 10 w.p.m. in our ten-week course, identifying almost every letter with music. For instance Q (dahdahdidah) became "here comes the bride." V (didididah) became Beethoven's Fifth Symphony, etc.

One of the most severe problems we run across is the financial one. Parents are loathe to make an investment in gear which might prove worthless or useless unless the youngster obtains a General ticket. Then, too, there is the problem at home of the boy's spending too much time on ham radio and too little on homework. Amazing, however, is the fact that a great degree of control over the boy is made available through the possible denial to him of the use of his ham equipment unless he toes the mark both in the home and at school.

I have seen many instances where the boy has for the first time in his life made it his business to "earn a buck" so as to purchase amateur radio equipment. The purchasing power of the dollar . . . where to buy . . . how much to pay . . . what to buy . . . do I need it, or can I do without it . . . can I get it surplus . . . can I buy it used. It's a wonderful experience.

We have had a great deal of help in this work from W2s KU, DGF, KAC, AKK, KVG and others. — *W2HNG-HNI.*

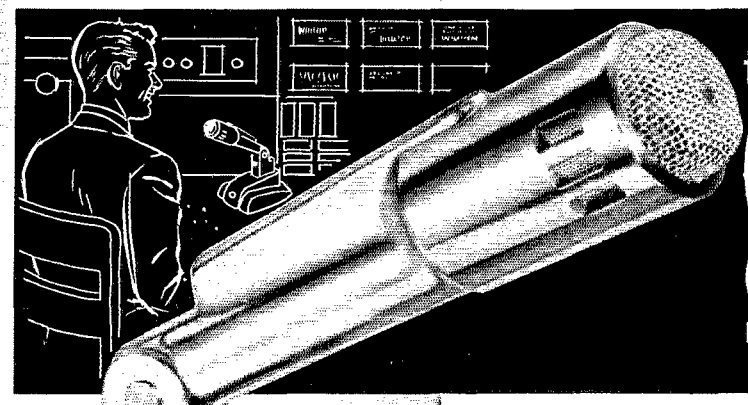
Middlesex Amateur Radio Club (Waltham, Mass.):

Our classes have been held every Tuesday evening, the year around, from August 1951 to the present date. We've helped people obtain close to 600 licenses of various types since we started and our club is composed entirely of students — past or present — although membership is open to anyone at all who's interested in joining an active ham club.

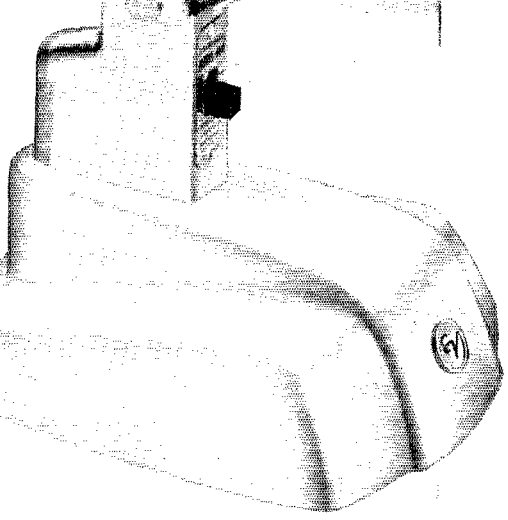
From 7:30 to 9:00 P.M. the following classes are simultaneously in session: fast code — 10–20 w.p.m.; slow code — 5–10 w.p.m.; beginner's code — 0–5 w.p.m.; radio theory and FCC Regulations Training.

Through the coöperation of the FCC, we maintain a supply of Novice and Technician

If you operate 'phone YOU WON'T BE SATISFIED UNTIL YOU OWN



the completely new 664 VARIABLE D* CARDIOID DYNAMIC MICROPHONE



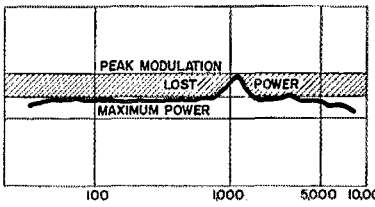
The 664 will equal a useful power increase of four times over commonly-used peaked microphones, and could well be the best investment, dollar-wise, in your shack

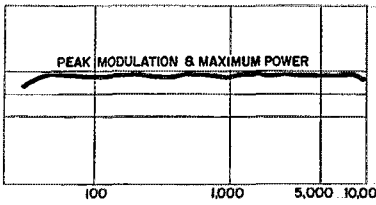
Here is a totally new concept in microphones for amateur phone communication.

The cardioid (high directivity at all frequencies) pickup pattern enables you to have a *real* "arm chair QSO." The forward gain of 5 db** allows you to speak at nearly twice the distance you have been working to a conventional microphone. Unwanted sounds in the shack are rejected nearly twice as effectively as by ordinarily-used non-directional microphones.

The response curve is tailored to put the highest degree of intelligibility on your carrier. Your 100% modulation is all speech . . . in full character . . . with bite and punch. This curve, compared to ordinary microphones, will give you up to 12 db more usable audio—without splatter or hash.

We invite you to prove to yourself that the 664 will outperform your present mike by a direct comparison. If it doesn't out-hurdle QRM, your distributor will refund the purchase price without qualification.





A peak in the response curve limits modulation to the peak value. A peak-free response brings the full power level to 100% modulation gaining an intelligibility increase equal to the peak in the average mike. The 664 is peak-free and gives the highest usable power of any microphone for AM, NFM and SSB.

New Variable D* Dynamic Microphone operates on the principle of multiple sound paths to the diaphragm. Spaced apertures to the rear of the diaphragm are phased to provide cancellation of rear sounds and give full response to sound from the front.

This new principle enables the curve to be free from peaks or dips. Insures freedom of blasting and boominess from close talking. Eliminates effect from mechanical shock. High level —55 db. Acoustalloy diaphragm. Switch easily changed to relay control, if desired. Absolutely unaffected by moisture, humidity, or temperature.

Model 664. Without Stand.....Net Price: **$47.70**
Model 419. Desk Stand.....Net: **9.00**

**Forward gain is that compared to a pressure mike; actual front-to-back hemisphere pick-up ratio is 20 db.

*Patent Pending

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Class examinations and we provide licensed supervision of these examinations each Tuesday; I've obtained a Commission as a Notary Public and I notarize the necessary forms for the applicants. The following amateurs work regularly instructing at the club: W1BTX, W1DLF, W1FZG, W1FQG and W1SAD, aided by all others as required. We issue Club Code Proficiency Awards to those who request them. We maintain a good library and our librarian keeps books in good condition and circulation.

The club net is held Thursday evenings on 3746 kc. primarily to provide "on the air" practice for our newcomers. The club owns a good supply of crystals and we have them available to all members for loan, swap or sale. We have a small supply of code practice oscillators, hand keys, earphones, etc. and we loan these out to encourage "at home" practice. The club station is located on the premises and we are currently completing a DX-100 xmtr for use at this station.

At 9:00 P.M., following the training classes, the regular club meeting is held at which we conduct our regular business and many of these meetings are highlighted by speakers from nearby electronic companies. — *W1SAD.*

Graduates of the Novice courses conducted by W1OTZ under the sponsorship of the Radio Shack in Boston receive this striking diploma.

Strays

MORE ON TRANSISTOR DX

Long distance contacts using low powered transistor transmitters are becoming more frequent. The latest report is from W1CUT in West Hartford, Conn., who has worked four states on forty meters. The best DX so far is W9ZA in Des Plaines, Illinois, a distance of about 800 miles. W1CUT's transmitter consisted of two CK761 transistors, one used as a crystal oscillator and the other as an amplifier. Power input to the amplifier was 55 milliwatts (9 volts at 6 mc.). All contacts were made in the usual manner, without prearrangement or help.

Coincidences. Back in the 1920s famous W9ZA worked a little low-power DX himself: VK and ZL with a 199 (tube) and a 45-volt battery.

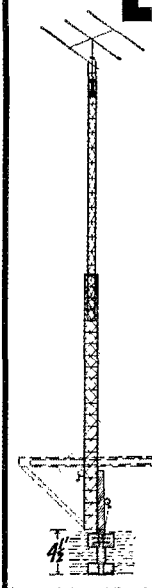
E-Z WAY TILT OVER TOWERS

(Patent applied for.)

Devised and created by E-Z Way over 5 years ago. Often copied but never equalled.

IT'S THE ORIGINAL **TESTED AND PROVEN**

"Ask the Ham who owns one." More than 15,000 satisfied users. One of the sturdiest and most versatile towers in the industry. Don't send a boy to do a man's job. E-Z Way Towers are *designed* to support Rotary Beams—not just a lightweight TV antenna. *We invite comparison.*



Patented Ground Post in Good Old Terra Firma

TILT OVER with Ground Post

Six types to choose from—40 to 65 ft. Built to support anything from a Mini-Beam to the heaviest. Cranks down and tilts over for quick, easy adjustment. No guy wires needed. Patented ground post is 3½" steel pipe or larger.

Tower	Tower Hgt.	Price
GPRBD—40	38 ft.	**$120.00**
GPRBS—40–45	38 ft.	**$160.00**
GPRBS—50–60	48 ft.	**$210.00**
GPRBS—60–65	58 ft.	**$260.00**
GPRBX—50–55	48 ft.	**$325.00**
GPRBX—60–65	58 ft.	**$385.00**

BUILDING ATTACHED

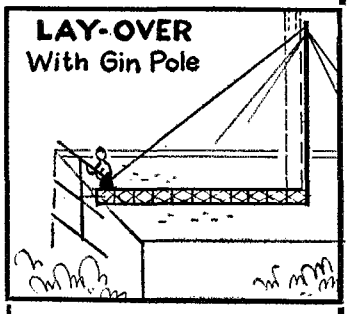
The six towers shown above are also available with a wall bracket and hinge for the base for attaching tower to the side of a building. Crank up and down.

BARBD—40	**$ 95.00**
BARBS—40–45	**$130.00**
BARBS—50–60	**$170.00**
BARBS—60–65	**$210.00**
BARBX—50–55	**$265.00**
BARBX—60–65	**$325.00**

Three types to choose from—40 to 60 ft. Ideal one-man installation for flat roofs or porches. Cranks up and down and lays over for easy antenna adjustment. No guy wires needed. Tower is locked in a V-bracket at top of gin pole.

GINRBD—40 **$125.00**
GINRBS—40–45 **$165.00**
GINRBS—50–60 **$215.00**

LAY-OVER With Gin Pole



Add 10% to prices shown for West Coast orders. All E-Z Towers have heavy dip-coated Goodyear Pliolite S-5 (rubber base aluminum enamel). Hot dipped galvanized available at extra charge. ⅛" aircraft cable 2000 lb. test used on D-40 towers. All other cable is 5/32 aircraft 2600 lb. test.

Provisions to mount rotor inside top of tower. Bearings at A and B relieve all strain from rotor.

BUILD IT YOURSELF

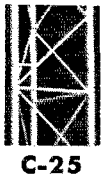
Go as high as you like with 20 ft. sections. 320 ft. if you like.

C-10

Width 10" Max. Height 120 ft. Guy Spacing 27 ft. Weight per ft. 4½ lbs. Price (approx.) $2 per ft.

C-15

Width 14" Max. Height 200 ft. Guy Spacing 40 ft. Weight per ft. 8 lbs. Price (approx.) $3.50 per ft.



C-25

Width 25" Max. Height 320 ft. Guy Spacing 60 ft. Weight per ft. 20 lbs. Price (approx.) $9 per ft.

Used extensively for VHF and UHF communication antennas. Two other sizes available. When maximum height and guy spacing are not exceeded, these towers will withstand a 40 lb. wind load.

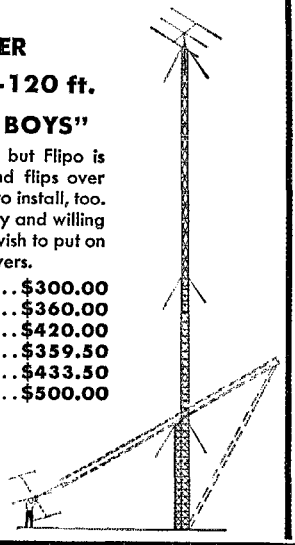
FLIP OVER 80-100-120 ft.

"FOR THE HIGH BOYS"

Gets you up in the air but Flipo is easily cranked down and flips over to adjust antenna. Easy to install, too. A real sturdy brute ready and willing to carry any load you wish to put on it. One of our finest towers.

FORBS—80	**$300.00**
FORBS—100	**$360.00**
FORBS—120	**$420.00**
FORBX—80	**$359.50**
FORBX—100	**$433.50**
FORBX—120	**$500.00**

E-Z WAY TOWERS ARE MADE IN FLORIDA TO WITHSTAND WINDS OF HURRICANE FORCE.



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When writing for catalogue No. HT, please specify type of tower in which you are interested, height and expected antenna load, (make and model number if possible). This information is necessary to give you accurate advice.

E-Z WAY TOWERS INC.

5901 E. BROADWAY PHONE 4-3916
P. O. BOX 5491 TAMPA, FLORIDA

(*Continued from page 86*)

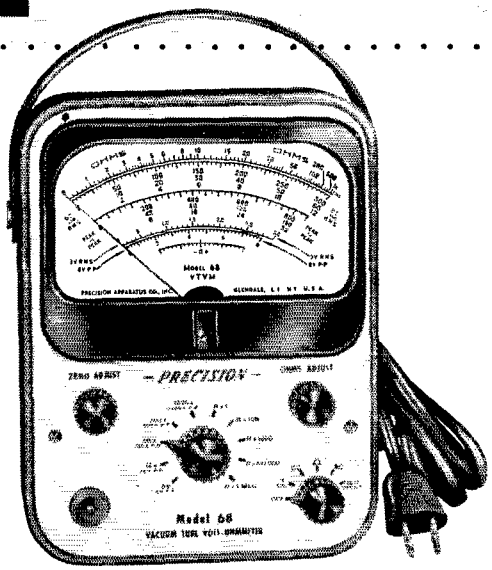
trol, AZA, EHA, GCA, GCK, GPQ, KCW, NBT, NFT, TAF, and YIJ, and K2s ABQ, AMN, CCM, EAF, GJM, IDB, and OBH. K2AMP, with 3QKW is starting a teacher's c.w. net on 3612 kc. on Fri. at 2100 EST. All interested teachers are urged to contact Wally. KFV and KEB made BPL. IAW moved to Lynbrook. K2CQP finished a 30-watt 10-20-meter mobile rig to go with his Elmac receiver. KN2MGE received her RCC certificate. VDT traded mobile gear for a 75A-3. K2AMP is on 2 meters with a borrowed Communicator but soon will be heard with a new homebrew rig. K2DEM has 54 countries and is using a 75A-4. K2HYK is working DX on 15 meters. Ditto KN2OON with a low-power rig. LGK uses a Williamson amplifier as a modulator and it works FB. OBU soon will be heard on 10-meter mobile with an Elmac in his new Buick. IAG reports new members of the Queens AREC are NNH and K2s DEM, DGR, HYK, KAR, and KMA. K2CTK is doing an FB job as 10-meter EC in Brooklyn. DLO/4, Eastern Florida section, is looking for NYC-LI contacts in the CD Party. AOD worked Virginia on 420 Mc. for his first W4 on that band. HJ is running 20 watts to a 2E26 on 144 Mc. IVS reports that the new car has kept him off the air. LPJ returned to the NLI Net. K2BAH used 3 watts to contact WØ-Land on 20 meters. K2DDK is enjoying 2-meter DX with 6 states worked in only one month. K2GGG is a new member of the Order of Boiled Owls. K2IAG, president and trustee of the Newtown HSRC, K2LBD, reports the station is active with a Globe Scout and an S40-B. MFN/2 is operating from the dormitory of Rensselaer Polytech. Nine-year-old KN2PFA, the daughter of KN2MFD, is one of the youngest hams in the section. CB is building a 100-watt rig for the Nassau Radio Club. K2ODE dropped the "N" and is active with a DX-100 and an S-85. ELK has been appointed c.d. director for Wantagh. GG has a new 75A-4. RB and GYL now are heard on s.s.b. with 20As and linear finals. NFU moved to Queens. New members of the NYRC are BFI and K2s HBU and ILF. DXN returned to action with 120 watts phone/c.w. on all bands. K2AMP is helping to organize c.d. radio in Amityville. K2GHS is running 813s at a kw. on 20-meter c.w. K2ETN moved to California. KN2s ONA and LTC are new stations in Plainview. KN2LTC runs a Communicator on 144 Mc. and an Adventurer and an NC-98 on the low-frequency bands. Remember the New Year's resolutions: Better signals and better operation mean more fun for all. Report your activity regularly and earn an official appointment in the section. Best wishes for 1956! Traffic: (Oct.) W2KFV 1052, KEB 1042, K2CQP 247, KXZ 231, W2VDT 137, VNJ 118, WFL 103, K2AMP 97, W2AEE 96, JOA 91, K2DEM 76, HYK 51, W2TUK 49, K2ABW 40, W2DSC 34, K2JEB 34, W2GP 25, PF 24, LGK 18, OBU 14, K2DVT 13, W2EC 12, IAG 8, GXC 5, K2CMV 2, CRH 2, W2MDM 2. (Sept.) K2DEM 73.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: NKD, CGG, and EAS. Garden State Amateur Radio Assn. officers are GUM, pres.; CQB, vice-pres.; K2ALO, secy.; QFQ, treas.; NBE, chief eng. FSL is rebuilding the rig. K2DSW has to limit activity as he is attending RCA Institute. K2GBP was home from college for a few week ends. KN2KLR now is General Class and spends most of his time on 40-meter phone. NIY is doing lots of brasspounding. BRC says, "CD Party was fun. A good warm-up for SS." K2EQP is back on the air after a two-month layoff. John is conducting code classes at Federal Tel. Labs. in Nutley. The Knights of Communication is a new club meeting each Wed. at 337 Amon Terrace, Linden. The Club is pledged to assist prospective amateurs in obtaining their FCC licenses. K2EQD completed WAC on 40-meter c.w. and also made WAC on 15-meter c.w. in a single day with only four hours operating time. The Tri-County Radio Assn., Inc. elected PIX, pres.; BRC, vice-pres.; K2CSC, secy.; BJE, treas. YJC was winner of one of the special certificates given by the Windblowers V.H.F. Society during its recent "Big Blow." HJL also was a winner. A recent guest speaker at TCRA was IDZ. Ed spoke on 50-Mc. techniques and equipment. ZMG is mobile s.s.b. JME has moved to New Hampshire and is now 1GET. The TCRA 2-meter Net meets Sun. at 1300 and Mon. at 1900 on 146.43 Mc. Nonmembers are invited to call into the net at any time. K2KLR is putting up a new 20-meter antenna. HJD has just completed the new 50-watt mobile rig and is installing it in his new car. KN2PGI has a new Harvey-Wells T-90 and is doing a good job on 40- and 80-meter c.w. GID has moved to Texas. VAV has a new DX-100 on the air. VCZ is on 40 and 80 meters with a new kw. rig and has a rig on 160 meters at 150 watts. The Pompton Valley Radio Club's new officers are MLQ, pres.; ID, vice-pres.; CR, treas.; K2LKS, secy. The Club has a 2-meter net on Tue. at 2100 on 146.7 Mc. If you have a 2-meter transmitter give the NCS a call. K2DSW rolled up a fine score in the CD Party. VMX, Rev. Charles L. Wood, is a resident of Fair Haven. K2ICE has a super 144-Mc. antenna atop his tower. The Monmouth County RACES Net held an outing on Nov. 21st. The skillful planning of the evening's activities by K2IPR and the mobile group made the affair a grand success. KQJ is keeping the soldering iron hot these days with a new 144-Mc. rig the end result. On Nov. 24 K2DHE took to married life

(*Continued on page 100*)

2 NEW VTVM's *by* PRECISION

METAL CASED • MODESTLY PRICED • 5¼" WIDE-ANGLE METER



Model 68 AC OPERATED VACUUM TUBE VOLT-OHMMETER

The Model 68 is a wide range, AC OPERATED, general purpose electronic multi-range tester, especially developed in response to field requests for a modestly priced instrument completely FACTORY-engineered, FACTORY-wired and FACTORY-calibrated.

The Model 68 conforms to every *PRECISION* standard of quality, workmanship and value. Recommended for general electronic service-maintenance, in the shop and field.

★ **5 (+) Plus DC Voltage Ranges:** (Left-Hand Zero) 13⅓ Megohms constant input resistance. 0–3–12–60–300–1200 volts.

★ **5 (—) Minus DC Voltage Ranges:** (Left-Hand Zero) 13⅓ Megohms constant input resistance. 0–3–12–60–300–1200 volts.

★ **5 Wide-Spread Resistance Ranges:** 0–1000–100,000 ohms. 0–1–100–1000 Megohms.

★ **5 High Impedance RMS AC Voltage Ranges:** 0–3–12–60–300–1200 volts.

★ **5 Peak-to-Peak Voltage Ranges:** 0–8–32–160–800–3200 volts.

★ **5 Stabilized Zero-Center Reference Ranges** for FM discriminator balancing, voltage polarity determinations, etc.

★ **High Frequency Probe Facilities** available through use of accessory crystal probe Model RF-12.

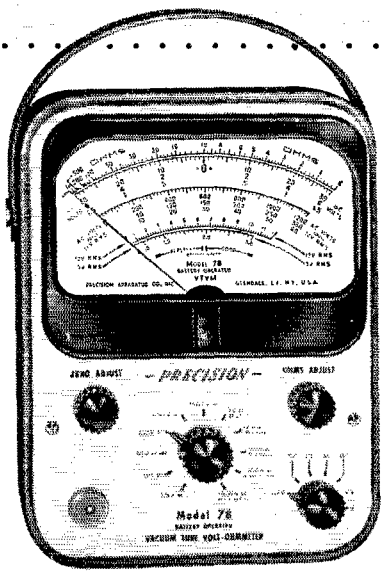
★ **One Coaxial, 3-Way VTVM Probe** serves all functions except that of High Frequency Probe RF-12 above.

★ **5¼" Wide-Angle PACE Meter:** 400 microamperes sensitivity, ±2% accuracy.

★ **1% Multipliers and Shunts:** Wire and deposited-film types.

★ **Deep-Etched, Heavy-Gauge, Satin-Brushed Aluminum Panel.**

Model 68: In rugged, blue-grey ripple-finished steel cabinet, size: 5⅞"x7¾"x3½". Complete with tubes, internal ohmmeter battery and detailed instruction manual.....**Net Price: $49.50**



Model 78 BATTERY OPERATED VACUUM TUBE VOLT-OHMMETER

The Model 78 is a wide-range, stabilized, BATTERY-OPERATED electronic test set, especially developed in response to field requests for a modestly priced instrument that will provide reliable VTVM performance with complete freedom from power line connection.

The features and ranges of the Model 78 are ideally suited to application in the fields of radio-telephone communications, electronic control, television, geophysical electronics, etc.

★ **6 True-Zero Center DC Voltage Ranges:** 13⅓ Megohms constant input resistance. 0 ±1.5 ±6 ±30 ±150 ±600 ±1500 volts.

★ **5 Wide-Spread Electronic Ohmmeter Ranges:** 0–1000–100,000 ohms. 0–1–100–1000 Megohms.

★ **5 Extra-High Impedance RMS AC Voltage Ranges:** 0–3–12–60–300–1200 volts. 8 Megs. input resistance; 67 mmfd. input capacity.

★ **High Frequency Probe Facilities** available through use of accessory crystal probe, Model RF-12.

★ **One Coaxial, 3-Way VTVM Probe** serves all functions except that of High Frequency Probe RF-12 above.

★ **Complete, Self-Contained, Battery Operation:** Special circuit engineering and optimum operating parameters provide a new high in long-lived battery performance and instrument stability.

★ **Built-In Battery Compartment:** All batteries conveniently replaced via removable cover plate.

★ **Battery Requirements:** Uses Standardly Available Commercial Batteries: One No. 477—67½ volts*, Two No. 950—1½ volts*, One No. 964—1½ volts* (*Eveready or equal).

★ **5¼" Wide-Angle PACE Meter:** 100 microamperes sensitivity, ±2% accuracy.

★ **1% Multipliers and Shunts:** wire- and deposited-film types.

★ **Deep-Etched, Heavy-Gauge, Satin-Brushed Aluminum Panel.**

Model 78: In rugged, blue-grey ripple-finished steel cabinet. Dimensions: 5⅞"x7¾"x3½". Complete with tubes, one set of batteries and detailed instruction manual.....**Net Price: $57.50**

Accessories Available for Models 68 and 78

Model RF-12: High Frequency Crystal Probe complete with low capacity x10 multiplier head. Frequency range to 250 Mc.....**Net Price: $10.95**

Model TV-4: Super-High Voltage Safety Test Probe with x100 cartridge for ranges to 60 kilovolts DC .....**Net Price: $14.75**

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and ventures into a new life with Jean, a swell girl. NIE has the new beam atop the tower. K2HNA has a nice signal on 144 Mc. with the new beam and tower installation. KN2LIU now is General Class. CYS was heard on 144 Mc. with a fine signal. Many thanks to all of the Jersey hams who took part in the recent civil defense test, "Operation Alert 1955." Attention is invited to the fact that Morris County (and Chatham) are *Northern* New Jersey. See ARRL By-Laws 25. (County was inadvertently omitted from Northern New Jersey list in the Operating Booklet but will be in next edition.) Traffic: (Oct.) W2EAS 163, K2EQP 57, GFX 54, W2BRC 42, VMX 25, CFB 6, K2DSW 5, W2CVW 4, K2BWQ 2, KLR 2, W2NIY 2. (Sept.) K2GFX 66, DSW 3.

MIDWEST DIVISION

IOWA — SCM, Russell B. Marquis, WØBDR — The Iowa section was well represented at the Midwest Division Convention held in Omaha. LXG is a Silent Key. LJW renewed his appointment. FRH is using a new HRO-60. SQE is working break-in with a B&W TR switch. FMX is on 14 and 21 Mc. with a new Telrex beam. TGQ has his 20-meter beam working again. AUL announced the birth of his 2nd YL harmonic, Holly Rae. KØADU made General Class. SCA is now TCC manager for the Central Area. INJM, from Headquarters, visited the Davenport Club. The Cedar Rapids Club furnished mobiles to help with the Halloween patrol. The Sioux City Club is active after a summer vacation. TLC, president, moved to California. Ex-QAO is now K6ORT. About 20 stations are checking into the Des Moines 10-meter net, tentatively called the Hawkeye Net. It meets three nights a week on 29.6 Mc. LKU is returning after two years operating KL7FAF for the Air Force. BLH and UCE won prizes at the Omaha Convention. A new club has been organized at Hampton, known as the H & F Club. LJW finally got his WAS after waiting 6 months for the last card. ATA is going single sideband with a 20A. FUB is on TLCN again after an absence of about 5 years. PZO is now liaison to TEN from TLCN. JDV is building up a new kw. rig. Traffic: (Oct.) WØSCA 1089, BDR 1073, PZO 749, BJP 287, CZ 261, LGG 232, QVA 225, SQE 102, UCE 95, LCX 74, BLH 60, LJW 33, SRQ 20, UTD 17, EHH 16, WPM 16, NGS 13, KØWAD 12, BPR 5, WØPKT 4, SEF 4, PAN 3, NYX 2. (Sep.) WØFDM 2.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH, PAM: FNS, RM: FEO. The Wheat Belt Radio Club hamfest held at Indianola, Nebr. Oct. 9th had 14 members present, plus XYLs, jr. operators, and friends. PAQ, who has been operating F7CA in Paris, France, is now at CGSC, Ft. Leavenworth. WER, of Newton, 13 years old, passed his General Class exam recently and wants you fellows to send me plenty of news for this column. QGG, of Chanute, our c.w. OBS, has changed his sked to 1800 Mon. through Fri. on 3610 kc. FCL/Ø is operating a vertical dipole with 20 watts quite successfully. YVM, of Chanute, has just received his ORS and OPS appointments. MOX, of Lawrence, one of our best OES appointees, has added Texas to his list of 2-meter contacts, now having Missouri, Kansas, Iowa, Illinois, Ohio, Nebraska, Oklahoma, and Texas. Louis says a lot of contacts are missed because some of the boys don't use c.w. Traffic: WØBLI 456, NIY 226, FEO 208, OHJ 201, MXG 146, FNS 116, QGG 109, YVM 39, SVE 38, FDJ 37, RXM 34, KSY 33, LBJ 33, ABJ 32, FCE 32, ECD 18, WJB 14, LOW 12, UAT 12, MVG 9, LQX 7, SAF 8, TNA 7, WWR 7, KØAHW 6, WØTSR 5, VFC 5, LIX 4, VNL 3, KNØCIY 2, WØDEL 2, FCL/Ø2, KNØAOQ 1, AWX 1, WØGYK 1. (Sept.) WØSVE 39, WJB 11, LQX 6, KNØAWX 1. (Aug.) WØSVE 13.

MISSOURI — SCM, James W. Hoover, WØGEP — SEC: MFB. PAM: BVL. RMs: OUD and QXO. MFB has been appointed Section Emergency Coördinator. KIK's traffic total was omitted last month, but he had reported on time as usual. QMF has a new 55-foot tower. PME took a 4000-mile vacation trip. KØBDT received an OPS appointment and reports the following from Moberly: KOI and his XYL, PSP, have a new receiver; vandals cut the antenna at KØACK; WEK has a new high-power final; IXK has a new 75A-4. VTF received a 1000 Traffikers certificate. Net control stations for MON, 3580 kc., at 1900 CST, Mon. through Fri. are OUD, DKQ, VTF, CKQ, and IJS. MON and MEN were in operation for the Simulated Emergency Test. HUI reported 13 active stations during the S.E.T. in Springfield. The Suburban Radio Club has raised its membership limit from 25 to 30 and has completed the move into new quarters. QDF, St. Louis, is giving beginners' code lessons on Wed. and code practice on Mon., on 1890 kc. from 1900 to 2000 CST. QXO reports the recent low traffic counts are a result of long business hours. Fifty-four Missourians were present at the Midwest Division Convention in Omaha. The Egyptian Radio Club held an open house for a visit from A. L. Budlong, 1BUD, on Oct. 19th. The occasion was well attended, and the talk by 1BUD was well received. Traffic: (Oct.) WØCPI 999, GBJ 466, GAR 320, PNA 209, OMM 172, BVL 144, IJS 126, OUD 63, VPQ 62, PME 56, RTW 52, CKQ 48, WFF 42, IIR 28, GEP 27, KIK 26, KA 14, VWZ 14, VTF 13, BUL 11, MFB 8, OIV 7, QMF 5, RTO 4. (Sept.) WØIJS 70, IIR 42, KIK 32, VWZ 10, GEU 4, KA 2.

(Continued on page 102)

NEW MULTIPHASE "Q" MULTIPLIER

- Peaks Desired Fone or CW Signal
- Nulls Out Interfering Carrier up to 50 DB. No Loss in Speech Intelligibility
- No Insertion Loss — New Two Tube Circuit
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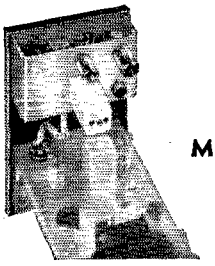
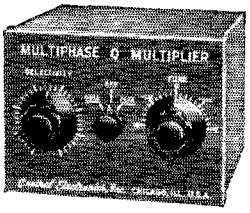


MODEL AQ



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MODEL B SLICER

CONVERTS MODEL A SLICER

Plugs into Model A accessory socket, converting it into a Model B. New front panel and controls provided. Enjoy all the advantages of "Q" Multiplier selectivity on CW, AM & SSB with your present Model A Slicer.

Wired.....$29.50
Kit.....$22.50

FOR AM, CW, SSB OPS

Desk Model "Q" Multiplier for use with any receiver having 450 to 500 KC IF. In attractive, compact case with connecting power-IF cable. Power supplied by receiver. Also provides added selectivity and BFO for mobile SSB or CW reception.

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Kit.....$22.50

BUILT-IN "Q" MULTIPLIER

Upper or lower sideband reception of SSB, AM, PM & CW. For use with any receiver having 450-500 KC IF.

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MODEL A SLICER

Same as Model B but less "Q" Multiplier

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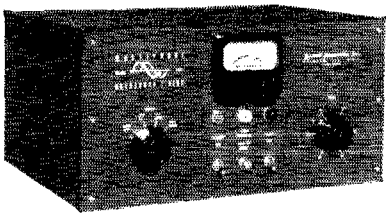
A NEW CONCEPT IN LINEARS



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BROAD BAND LINEAR AMPLIFIER

NO TUNING CONTROLS!

SINGLE KNOB BANDSWITCHING 10-160 METERS

- Single 813 in Class AB_2. Approx. 2 watts effective or 4 watts peak drive for 500 watts DC input.
- New band-pass couplers provide high linear efficiency: 60-65%.
- Designed for 50-70 ohm coaxial input and output.
- Built-in power supply. Bias and screen regulation. Automatic relay protection.
- Exclusive metering circuit reads grid current, watts input, RF output, reflected power from mismatched load — switch to any position while on the air!
- Completely shielded — TVI suppressed. Free of parasitics! Low intermodulation distortion.
- Choice of grey table model (17⅝"W, 8¾"H, 13"D) or grey or black rack model.

Wired, with tubes.....$349.50

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Check These Features

NOW IN BOTH MODELS

- Perfected Voice-Controlled Break-in on SSB, AM, PM.
- Upper or Lower Sideband at the flip of a switch, with 40 DB. suppression.
- New Carrier Level Control. Insert any amount of carrier without disturbing carrier suppression adjustments.
- Talk yourself on frequency.
- Calibrate signal level adjustable from zero to full output.
- New AF Input Jack. For oscillator or phone patch.
- CW Break-in Operation.
- Accessory Power Socket.

MODEL 20A

- **20 Watts P.E.P. Output SSB, AM, PM and CW**
- **Bandswitched 160 — 10 Meters**
- **Magic Eye Carrier Null and Peak Modulation Indicator**

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....$249.50
Complete kit.....$199.50

MODEL 10B

- **10 Watts P.E.P. Output SSB, AM, PM and CW.**
- **Multiband Operation using plug-in coils.**

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

Wired and tested.....$179.50
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WRITE FOR LITERATURE ON THE COMPLETE MULTIPHASE LINE

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Tom Boydston, ØVYX. SEC: JDJ. PAM: HTA. HTA is now Phone Activities Manager in addition to being Nebraska Phone NCS. The only YL in Western Nebraska has dropped the "N" and now becomes WWD. NIK reports some DX on 10 meters lately. AIN is using a ground plane on 20 and 15 meters. ACZ has dropped the "N" also. QKR is EC for Gering. ZIN is EC for So. Sioux City. The boys at Scottsbluff are really going to have an emergency set-up soon. CIO is working on a new antenna system for the beginners. MAO invites all to join the NSS. The main object of the Net is the training of Novices. The North Platte Club station (WYM) was in operation from the Fire Station Halloween with CBH and RIG operating. LRK, UH, KWQ, ERM, OHK, and BBS were mobile spying on the "trick or treaters." LRK and NET have phone patches. AIN has renewed his ORS appointment. RIN is close to a half jug (304-TL) on 20- and 40-meter c.w. KNØBZX reports half of his QSOs for WAS have been confirmed. That 807 and S38-D receiver is doing fine. RRN asks all who prefer c.w. to QNI the SDN on Mon., Wed., and Fri. 1900 CST on 3645-3648 kc. PON is acting net reporter for the Nebraska Phone Net. RDN scored 106,785 points in the Oct. CD Party. KON is back in North Platte. Traffic: (Oct.) WØDDT 295, ZJF 293, RDN 252, LJO 96, MAO 62, AEM 51, EGQ 30, HTA 29, KØWBF 22, WØTIP 21, NIK 20, KØFBD 17, WØZOU 12, DMY 11, YCY 11, FTQ 10, LFM 9, CBH 8, KLB 8, FRS 7, EXJ 6, FMW 6, GVA 6, KDW 6, SZL 5, AGP 4, BEA 4, NHT 3, PON 3, BOQ 2, DDP 2, DJU 2, EFV 2, GTW 2, IAY 2, OFL 2, OOX 2, PQP 2, QOU 2, RMO 2, OCU 1, VGH 1. (Sept.) WØORW 20, AIN 2.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: LWW. RM: KYQ. MCN and CN 3640 (0645 and 1845), CPN 3880 (1800 Sun. 1000), CTN 3640 (Sun. 0900), CEN 29,580. Traffic reports: CN 262 in 26 sessions with high QNI by KYQ, LV, AW, and RGB; MCN 96 in 21 sessions recording RGB, RFJ, and IBE as most consistent; CPN 220 in 30 sessions with honors to RMZ and RRE. Club notes: New officers at Southington: ZZK, pres.; EQL, secy.; and GVT, treas. At CARA: ZKQ, pres.; TYQ, vice-pres.; ACR, secy.; and FBD, treas. Waterbury: OOL, pres.; ZTG, vice-pres.; ex-ANE, secy.; and EQF, treas. Any other club elections? Congrats to YYM/WPO on the arrival of a new jr. operator. The EC report from WX tells of recent flood activity with the Red Cross and CEB. ECH received his General Class ticket at Winsted. QPD is the new act. mgr. of the Middlesex Club. MRA has a QSO party on alternate Thurs. on 29,580 kc. EGX dropped the "N" from his call and has been knocking 'em off on 15 meters. YNP reports transmitter difficulties have upset his OBS skeds but should be cured by now. TTA now signs KA8AB. WHL entertained 4YTD and his XYL recently. TVN reports the Tri-City Council is getting new members and has an interesting sked lined up for meetings. ABZ requested new certificates because everything was lost or damaged in the Ansonia flood. BGP was flooded at Stratford but came through with a report citing the activity of TCW, GVK, RFJ, and WN1EWS. APS and WN1ZGF are busy with v.h.f. experiments. GHI has a new 60-foot mast. BVB is recovering from a broken knee and is back on MCN. APA still is connecting well on 7 Mc., including 49 stations in 28 countries in one week end. TD continues his 146-Mc. OBS sked and now is trying 3.5 Mc. BDI has a new 6-over-6 beam for 2 meters and laments the frequency of floods that disrupt other activities. HYF reports fun in the CN Party. Appointments: APS as OES, ANU as OO, EGX as EC. RRE renewed EC appointment and NLM renewed ORS and EC appointments. RAN is planning an active season from K4WEE and renewed ORS appointment. Traffic: (Oct.) W1AW 406, YBH 212, KYQ 185, RGB 142, LV 104, BDI 75, TYQ 72, EFW 55, YCQ 53, UED 45, YNC 38, RFJ 29, RRE 25, HUM 21, CUH 20, KV 15, YNP 7, APA 6, GVU 6, BVB 2, HYF 1. (Sept.) W1YCQ 25.

MAINE — SCM, Allan D. Duntley, W1BPI/VYA — TWR, who is spending the winter in W7-Land, has resigned the PAM position. With the advice and consent of a majority of the hams on the Sea Gull Net I have appointed WTG as PAM. Good luck to you, Chuck, in your new adventure. As Chuck is only seventeen, we wonder if perhaps he is not the youngest PAM in the League. Let's hear from you on this score. The Androscoggin Amateur Radio Assn. has moved to new and finer quarters in the Red Cross Bldg. at 444 Main St., Lewiston. This up-and-coming club now holds code and theory classes each week Tue. and Wed. evenings. TVB is the very able code instructor. Anyone interested in joining can contact the club any Wed. evening at the club rooms. I would like to hear from any other clubs on what they are doing and will give you a write-up as space is available. A nice letter was received from that "Peach Colored Plymouth." Congrats might be in order. WN1GFP will have lost his "N" by the time this goes to print. WAS is

(*Continued on page 104*)

The W4GL All Driven Rotary Antenna

20 METERS

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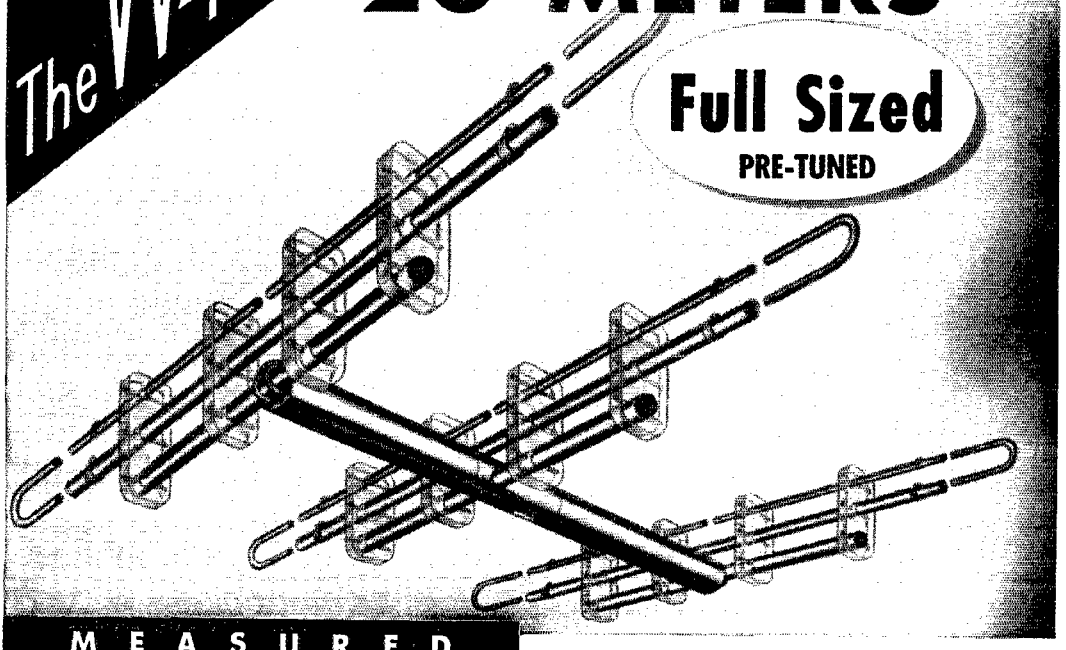

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EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: BOA as ORS, TWG as OO. Appointments endorsed: ALP, UIR, and NF as OBSs: EMG, BDU, AVY, and EPE as ORSs: UE as RM for 80 meters; AVY New Bedford, HUP Dover, ATP Holliston, QQL Lynn as ECs; HUP and AVY as OPSs. The following took part in the Sept. F.M.T.: GDJ, PXH, CLF, THO, BB, AYG, WK, CMU, and TF3CJ. Heard on 10 meters: ANA, MF, ADD, LMP, VTH, AZF, AJG, JLN, NBE, BJX, ZZD, VIS, THL, NO, FMQ, ZXZ, and K2BNI. Heard on 2 meters: JMK and NTN. Heard on 75 meters: YCR, RE, VVL, COX, MKX, GNX, and 6DGD/1. Chatham. The QRA had an auction. KWD went to VE-Land. MME went to Florida. AJU is working down in Maryland. K1USA is working on antenna and coils for 15 meters. UKO has a 15-meter cubical quad antenna. BB is active in 160-meter DX tests. OG/1 was at the Telephone Pioneer Hobby Show in Boston, with GAG, OKB, OG, and YPH as operators. LM is bothered with arthritis in his hands. VTT is on 10 and 15 meters. ABJ has a new three-element beam on 20 meters and a six-element on 10. LLY handled an important message for NDI in Maine and TLR drove 16 miles to deliver it. K2BNI/1, from Albany, is Deputy State Radio Officer for c.d. SS gave a talk at Oneida, N. Y. The South Shore Club held a c.d. meeting and DFS and BL spoke. The Club now holds meetings at the Health Center, 1120 Hancock St., Quincy, the 1st and 3rd Fri. at 7:45 P.M. Visitors are welcome. Radio Amateur Open House held a meeting and OOP spoke on "Scatter Propagation." The Braintree Radio Club held a meeting. BWU, Carmelite Jr. Seminary, is on the air. GAX and AGA are on the air in Hamilton. AGA has a new three-element beam on 20 meters. LQQ has a new QTH. The Yankee Radio Club elected ATU, pres.; COH, vice-pres.; SAK, secy.; VRK, treas.; RRF and LXI, directors. BGW still is on RTTY on 40 and 80 meters and on 2 with FGL. CLF has 1 kw. on 75 meters and mobile in the car. New officers of the Wellesley Amateur Radio Assn. are VEJ, pres.; WTY, vice-pres.; OQP, treas.; ZDZ, secy. Meetings are held the 3rd Mon. of each month at the Wellesley Hills Branch Library. Officers of the Cape Cod & Islands Amateur Radio Assn., Inc. are BCN, pres.; LYV, vice-pres.; MKW, secy.-treas.; YHQ, DJK, UTU, and ZEJ, directors. YHQ is in the hospital with polio. DFS is getting crystals for the State of Massachusetts. The 2-meter net meets on 145.5 Mc. and everyone is asked to monitor this frequency and to avoid QRMing it. Area 1 Radio Comm. held a meeting with AWA CQ, IPA, AR, BL, ZYX, QQL, TQP, KTG, and SX attending. PRR helped WN1HHC get his ticket. ZNQ is active on the Eastern Mass. Net on 3660 kc. and is NCS on Wed. night. EMG is back on the traffic nets. AKC is new chairman of the Central TVI Comm. of Greater Boston. At the last meeting Mr. Lee, FCC Regional Manager, North Atlantic Region, spoke. The T-9 Radio Club met at CVM's QTH. MNK is stationed in Portugal. SS reports the Bedford Radio Club had a station at the Hobby Show in Boston. YOR is on 10 meters at home and on mobile. A write-up appeared in the *Boston Globe* about an electronic gadget to help ZFD tune his rig by sound, as he is blind, with many thanks to YHM for his 2-meter rig. WGN has a B&W 5100S. HBM is running a 616 rig. FJI has an HQ-140X. WN1DIY is leading the local Novices with contacts and DX on 80 meters. SSS has a new antenna for his TBS-50. ZFS checks in with the New Bedford C.D. Net on 10 meters. The Malden Amateur Radio Assn. held an auction. BOX has gone into the Navy. ZVO is working on power supplies for the Winthrop c.d. During the last drill BDU, AGB, CMW, DEL, DLY, DPN, DUV, MQB, NMX, OIR, DJ, HFJ, TEO, and EAJ were on. SON is on 75 meters. New officers of the Waltham Amateur Radio Assn. are 2BVU, pres.; ELP, vice-pres.; PYM, secy.-treas. ISU, Holbrook EC, has 7 hams in his town for c.d. work: JLQ, NIE, NBT, PJE, FED, JXM, and FWS. More on 6 meters: BYB, BYM, CAX, COH, DRK, DJD, EK, GBK, HAA, KTL, LAD, NQA, PWV, QA, RWT, RCJ, URT, UPU, YMC, YZC, CIX, and FLD. CLS had to have an operation in Seattle. DJ has been ill. AJI had his 3rd boy. JOW moved to Weston. GJZ is going back to Bridgton, Me. VCZ has a new QTH in Arlington. BYI has a new P.A. on his Gonset 6. UAR, ex-1BBT, has a Gonset on 6 meters. GCE has a new Kreco coaxial antenna and Gonset on 6 meters. FOS has a new five-element beam and over 200 watts, 4X150B. ZML is on 6 meters with a Gonset and six-element beam. VHD has a new QTH in Roslindale. AJC, the son of VHD, has his General Class. Quincy's RACES plan has been sent in. WK is Radio Officer and HGJ and ZSS are his alternates. ALP has sent in the Sector 1-B's Radio Officer's forms and WFQ and ZWQ are his alternates. Traffic: (Oct.) W1USA 900, EMG 365, UKO 153, EPE 109, AVY 104, IBE 74, BOA 62, UE 45, TY 36, ZNQ 33, NUP 30, BB 24, LM 14,

(*Continued on page 106*)

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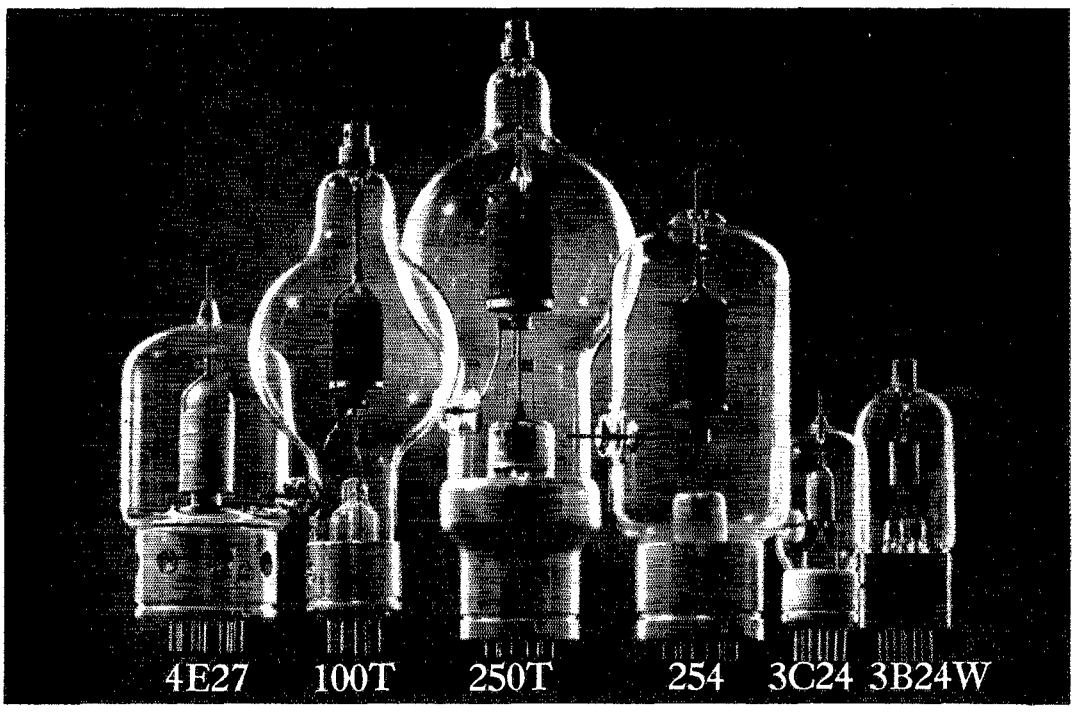

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BY 9, VTT 9, WU 8, AKN 7, ATX 4, LLY 3, ALP 2, QLT 2, K2BNI/1 1. (Sept.) W1ABJ 6, AKN 5.

WESTERN MASSACHUSETTS — SCM, Osborne R. McKeraghan, W1HRV — SEC: RRX. RM: BVR. PAM: QWJ. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 P.M. EST. New officers of the Hampden County Radio Assn. are RFU, pres.; PHU, vice-pres.; VNE, treas.; UKR, clerk. Springfield has received RACES authorization. BYH has received the WNH award and is working on the WAM award. PRI gave an interesting talk to the BCARA on 'scopes in s.s.b. work. UEY has a new 813 rig. DPY has been appointed C.D. Radio Officer for Sector 4E. KUL is Radio Officer for Sector 4A. A new ham in Southampton, GRB, was active during the recent storm emergency. An ORS certificate goes to EOB, who recently returned to this section. The radio class at West Springfield High School has an enrollment of 40 and is doing fine under the direction of KUL. Radio Officer RLV, of Ludlow, has filed for RACES approval. AVK has a new Collins 75A-4. FPH has a new 10-meter beam. TAY is very active on TCPN with 40 watts and often acts as net control. A group of mobiles in the Mendon, Hopedale, Blackstone Area did a fine job during the August flood. Because of their efforts and those of members of the Blackstone Valley Amateur Radio Club and the Mendon C.D. Net, news of a dam break in Hopedale was relayed to authorities and enabled prompt evacuation of Social and East Blackstone before any lives were endangered. Word of the breakthrough came from ZAM, mobile, who was stationed at the danger point. AZW reports success in the CD Party. DXW has a new 10-meter beam and an HRO. C.d. activity in the section is good and state and local plans are progressing slowly but surely. Soon we should have some 6-meter c.d. gear in operation in the section. Traffic: W1ZUU 148, UKR 145, BVR 63, DWA 53, HRV 52, BKO 30, TAY 24, BYH 11, HRC 6, AMI 4, AZW 2.

NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU. RMs: CRW and COC. PAM: CDX. The Granite State Phone Net now operates Sun. at 0900, and Tue. and Fri. at 1700 and 3842 kc. NCSs are KPD, CDX, and JNC. Purpose: Traffic and ragchews, with the first Sun. of each month a swap session. The University of New Hampshire Radio Club, ASZ, is now under way and has elected UKS, pres.; YJW, vice-pres.; ex-KN2IAZ, secy.; Dick Whiting, treas.; ARR, chief op. Other licensed members are WUO and YGA. Several interested members are being coached for their Novice licenses. CCE, TTU, and RMH are planning to go s.s.b. BFT and RMH are working on a RTTY set-up. LCD has plans for a beer-can vertical. On Sept. 25th eleven members of the Nashua Mike and Key Club held their annual outing and were entertained by OMZ at his summer QTH on Lake Winnipesauke. QGU has been having FB contacts on 3550 kc. with W2s, using a 20-milliwatt transistor rig. His record to date is 260 miles (Snowville, N. H., to Upper Montclair, N. J.) He returned to W2-Land Nov. 3rd. The Nashua Mike and Key Club now is in possession of a 20-meter rig running a kw. with a two-element beam on a 40-ft. tower and DX is rolling in. YJD is attending school in Belgium. Traffic: W1SAL 122, GMH 82, COC 32, ARR 31, QGU 27, DYE 9, FZ 8, WBM 8.

VERMONT — SCM, Robert L. Scott, W1RNA — SEC: SIO. PAM: RPR. RM: OAK. The Vermont Civil Defense Agency sponsored a Radio Amateur Communications Emergency Service (RACES) conference at the State House. It was held in the House of Representatives Oct. 16th at 1300 hours. Guest speakers were Vincent Kenney, Chairman of the U. S. Civil Defense Amateur Radio Alliance and N. Y. State C. D. Radio Officer; Phil Rand, DBM, Director of the New England Division and Area 1 Radio Officer for Connecticut State C. D.; CGW, Vermont State C. D. Radio Officer; and RNA, UEQ, Asst. State Deputy Director of C. D. and State C. D. Communications Officer, was moderator. Jeanne Walker, 2BTB, well known to all traffic-handlers, was introduced. The Helping Hand Program over WCAX-TV featured the BARC, with KOO as control station for a c. d. demonstration on 10 meters. Traffic: W1OAK 143, AVP 79, UEQ 47, BJP 21, UGW 21, IT 20, KJG 18, RNA 18.

NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — The Anchorage Amateur Radio Club held a Christmas party for all the hams in the Anchorage Area. GO has installed a mobile since moving to Anchorage and can be heard in pitching with the rest of the mobile gang. MF is getting in some good 10- and 15-meter DX mobile. As a matter of fact he is giving some of the fixed stations a run for their money. BFW is hitting the 10- and 15-meter bands quite heavily lately, from the home rig that is. It is getting close to the time for all the hams in KL7-Land to be thinking about the award to be given to the ham in Alaska who has done the most to further ham radio in the Territory during the year 1955. Nominations are in order Jan. 1, 1956, for the year 1955. All nominations should be sent to the Anchorage Amateur Radio Club, Box 211, Anchorage, Alaska.

IDAHO — SCM, Alan K. Ross, W7IWU — Grangeville:

(*Continued on page 108*)

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Iowa: Radio Trade Supply Co., 1224 Grand Ave., Des Moines.
Iowa: World Radio Labs., 3415 W. Broadway, Council Bluffs.
Kentucky: Hobe's Radio & Video, 119 Crab Orchard St., Somerset.
Kentucky: Universal Radio Supply, 533 S. 7th St., Louisville.
Louisiana: Radio Parts, Inc., 807 Howard Ave., New Orleans.
Michigan: Du Mez Bros., 31 East 8th St., Holland.
Michigan: M. N. Duffy & Co., 2040 Grand River, Detroit.
Michigan: Northwest Radio, 435 Tamarack St., Laurium.
Michigan: Purchase Radio Supply, 605 Church St., Ann Arbor.
Minnesota: Lew Bonn Co., 67 South 12th St., Minneapolis.
Mississippi: Swan Distr. Co., 342 No. Gallatin St., Jackson.
Missouri: Henry Radio, Butler.
New Hampshire: Evans Radio, Concord.
New Jersey: General Radio Supply Co., 600 Penn St., Camden.
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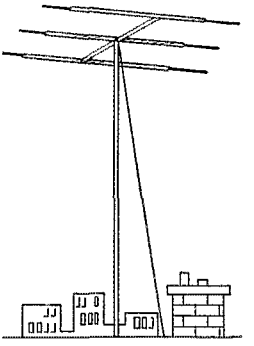

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☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95
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RSP reports he had to miss the FARM Net this past summer. He plans to build a new rig this winter. Smeltervile: WHZ sent a nice letter. His rig is a Globe Scout but he plans to use it to drive a pair of 811s eventually. The mobile rig is surplus gear but car noise in the modified ARC-5 receiver is bothersome. Plans are to build a crystal converter with noise limiter. St. Anthony: ZLO (EC) reports 4 AREC members, 3 mobiles, and 2 portables for drills. Meridian: MKS invites RACES applications. A number already have been sent out. The FARM Net operates each week night at 7 P.M. MST on 3935 kc. Net controls are WEY, HOV, WEX, NGU, and MWR, with JHY and ABK as alternates. MKS is net manager and AXY chief listener. Boise: There are five mobiles on 2 meters at this writing. The frequency is 145.44-Mc. f.m. We are considering another frequency for a.m. stations. 1DZ, Lewiston EC, with his group of mobiles patrolled assigned sectors, school areas especially for the city authorities, on Halloween. Assisting him were YBV, GMC, HDT, UJA, and KKY. The work was written up in the *Lewiston Tribune*. Traffic: (Sept.) W7ZLO 15.

MONTANA — SCM, Leslie E. Crouter, W7CT — The following are present club officers: The Gallatin Amateur Radio Club — TKZ, pres.; QHO, vice-pres.; Douglas Donald, secy.; 6PBP/7, act. mgr.; The Northern Montana Radio Club — TWH, pres.; MBH, vice-pres.; TGG, secy.-treas. The Hellgate Radio Club — COH, pres.; NCS, vice-pres.; NEG, secy. The Brady s.s.b. gang consists of ONI, MBH, TDW, and SFK. Billings mobile operators are YHS, DXR, YLH, JHR, YZQ, and CPY. WUJ opened a TV shop in Laurel recently and will be on 40 meters. QGJ is vacationing in Oklahoma. TTC has a new rig with p.p. 807s. RDM has a three-band 44-ft. vertical. PXW is teaching in Reed Point this year. Billings has another radio club, the Yellowstone Radio Club. OPM is a new OBS. Listen for his Official Bulletins. KJS spent a couple of weeks in Detroit. RSK and his XYL, RSI, have moved into their new home in Glasgow. VMA has moved to Valier. TPE has a new Morrow RX. VLZ, UDA, and TLA cooperated in dispatching some badly-needed car repair for TSG, who was stranded in Geyser. TLA delivered the repairs from Great Falls. Traffic: W7LBK 45, SFK 34, SMY 31, MQI 25, TTC 5, RDM 2.

OREGON — SCM, Edward F. Conyngham, W7ESJ — VBF reported zero traffic but a 90 per cent ragchew while he and VNS worked college algebra over the air. OMO has a new OBS appointment and schedule. QEI renewed his OBS appointment and is transmitting on 10 meters. BDU, in addition to being active on the lower frequencies, is going strong on 2 meters. SME has a 2-meter net going in the Eugene Area. QWZ received greetings from the local induction board. UHC did some fine NCSing for MARS through Japanese QRM and QSB. RER and TAZ are off on vacations. SEZ and RET are building the third model of a new 2-meter converter that works fine and costs little. WHE is building on his new 250-watter. AJN is shifting his QTH and building some new gear for it. KAB is looking over electronics courses. ESJ has just completed a new power supply for the ART-13. WN7ZXQ is working weekly on theory and code. There still is a very large number of Novice stations on 7400 kc. (second harmonics) coming through from the East Coast. Traffic: W7QKU 205, TIR 40, OMO 38, PRA 28, THX 27, BDU 24, BVH 17, BLN 16.

WASHINGTON — SCM, Victor S. Gish, W7FIX — PQT is the section's new SEC. All ECs are urged to get their Form 5 reports to him each month. See page 63 Nov. '55 *QST* for QTH. The Apple City Radio Club (Wenatchee) had a fine dinner meeting with Director CPY present. Its full membership is enrolled in c.d. and OVE, HQO, WHX, and EVB are ready for 2 meters. Despite the SCM's mailing notice of the Oct. 6th meeting of 1BUD and 7CPY to all clubs in the area, attendance was very poor. Bud gave a good talk on the ARRL. BA, PGY, VAZ, AHV, and WOK made BPL this month. The Northwest Traffic Net, 3920 kc. 0630 PST Mon. through Sat. c.w. or phone, is off to a good start. K4BCT/7 is in Bremerton while the USS *Roanoke* (CL145) is in the Navy Yard. The North Seattle ARC had a Halloween Party. RDL's XYL won an electric skillet. 6G1I now is a Seattleite. LVB's XYL finally let him move the shack into the house. T1Q is off the air modifying the rig for the new MARS frequencies. FZB had receiver trouble, the ACR-136 is getting tired. PKR has his DX-100 on the air. The Lewiston-Clarkston ARC had a hamfest Oct. 30th with 50 attending. BBK is QRL planting wheat. UQY has a new all-band vertical. TWQ is QRL c.d. and RACES on 6 meters. KTL is back in the section and is mounting a 10-meter beam on a 30-foot tower and will try loading the tower for other bands. FRU vacationed in the old home town, Quincy, Ill. WAH is NCSing RN7 Sat. NYJ is the most regular QNI on WSN on 3575 kc. at 1900 PST Mon.-Fri. YFO and VXE are rebuilding. CO with a gallon and CBE with a half-gallon are active on RTTY. YJE moved to North Seattle. GAT's paper is keeping him so QRL there is not much time for hamming. FIX is fouled up with too many nets at the same time — he can't get his ears out of phase. Traffic: (Oct.) W7BA 956, PGY 816, VAZ 502, FRU 201, WOK 129, AHV 128, OE 88, EHH 59, USO 52, AIB 42, APS 35, RXH 33, FWD 20, LVB 20,

(Continued on page 110)

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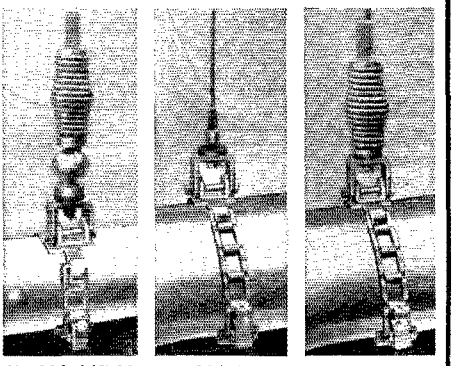

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Adjustable to any bumper. No holes to drill, easy to attach. High-polished Chrome Plated 3/8"-24 thread, to fit all antennas. Precision engineered.

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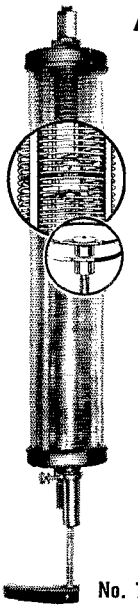


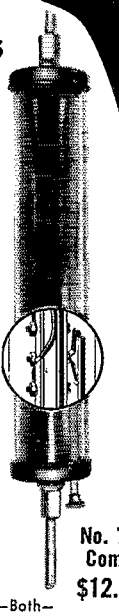
HY "Q" construction with wider spacing of turns for high frequency bands. Use as center or base loaded antenna with 60" whip.

No. 750—MASTER DELUXE..ALLBANDER

- Covers 10 thru 75 and all intermediate frequencies.
- Silverplated single turn contact, positive spring.
- Eccentric cam contact, easy selection of turn.
- Automatic lock prevents damage to coil.

No. 775—MASTER MULTIBANDER

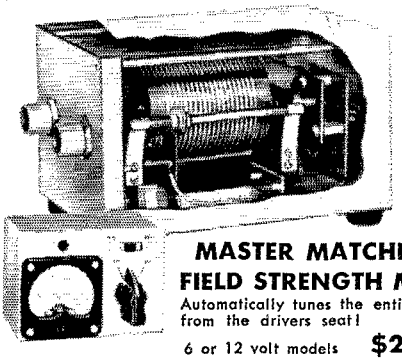
- Covers all amateur bands 10 thru 75. Select band with slide contact switch to preset taps.
- Seven silverplated contacts on heavy duty slide switch.
- Taps easily set with Grid Dip Oscillator.
- Bandspreader BS-195 furnished with coil for 100KC QSY.



No. 775 Comp. $12.95

No. 750 $14.95

Size—Both—
2 3/8" Dia x 13 3/4" Long



MASTER MATCHER & FIELD STRENGTH METER

Automatically tunes the entire band from the drivers seat!

6 or 12 volt models **$24.95**

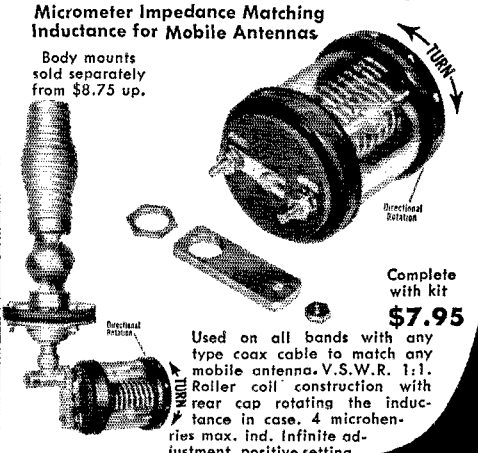
TENAJUSTER No. 99

6" adjustment for whip above coil. Light weight aluminum. Standard thread to fit all coils. **$2.95**

No.825 MICRO-Z-MATCH

Micrometer Impedance Matching Inductance for Mobile Antennas

Body mounts sold separately from $8.75 up.

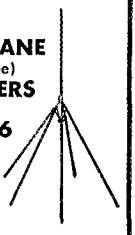


Complete with kit **$7.95**

Used on all bands with any type coax cable to match any mobile antenna. V.S.W.R. 1:1. Roller coil construction with rear cap rotating the inductance in case. 4 microhenries max. ind. Infinite adjustment, positive setting.

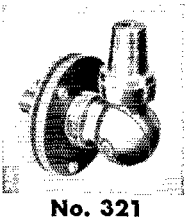
GROUND PLANE (Drooping Type) FOR 6 METERS

No. MGP-6



Aluminum alloy tubing, coax cable connector. For medium or low powered trans.

$14.95



No. 321 BODY MOUNT

Swivel base body mount, less spring. Specially constructed diagonal ball joint for maximum strength.

$7.95

Master Mobile Mounts, Inc.

1306 BOND STREET • LOS ANGELES 36, CALIFORNIA

AT LEADING RADIO JOBBERS EVERYWHERE

EYF 18, GAT 12, TGO 8, TIQ 7, FZB 5, WQD 5, CLZ 4, AVM 2, HDT 2. (Sept.) W7FRU 460, WAH 69, NYJ 59.

PACIFIC DIVISION

HAWAII — SCM, Samuel H. Lewbel, KH6AED — The Leeward Oahu Amateur Radio Club dedicated its new club house. The Navy, via Lt. Cmdr. Dixon, supplied the space in the old recreation hall at Nanakuli and the Club supplied the muscles. Result: One FB meeting room, one FB classroom, and one FB ham shack. KH6MOP is the call. Eversharp XI came off, with the hams under RACES receiving special mention for the top-notch job done. High spot of the exercise was the way the mobiles tracked down the Governor and let him get a first-hand activity report on the drill from General Makinney at HQ. Traffic: KH6AJF 1949, KP6AK 104.

NEVADA — SCM, Ray T. Warner, W7JU — Nevada State frequencies: Phone, 3880 and 7268 kc.; C.W., 3660 and 7110 kc. ZLQ and YAE, of Las Vegas, received their "Worked 25 Nevada" certificates. Newly-elected officers of the Southern Nevada Amateur Radio Club are as follows: VYC, pres.; BTC, VIQ, and JU, vice-pres.; TKV, treas.; YKQ, rec. secy.; ZLQ, corr. secy.; YKC and ARA, act. mgrs. BJY continues to handle the "Worked 25 Nevada" certificates. The appointment of SEC is open to any qualified member, preferably in the northern part of the State. An EC is needed in the Reno Area. 6COH met quite a number of Nevada hams on his recent trip to Boulder Dam. Pacific Division Director HC and YHM met with a group of Boulder City hams to discuss ARRL activities and traffic-handling. HC and SNP continue to check into the American Legion Net for occasional traffic.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — Asst. SCM: Roy E. Pinkham, 6BPT. SEC: NVO. OPX and OOU spent two weeks on Sacramento Peak in New Mexico as members of a party from the Stanford Research Laboratory studying meteor propagation. A group from Harvard University was at the same peak to analyze phenomena in spectro analysis of night sky light. While the Stanford group noted some very good sporadic E reflection with some F2 layer reflections, the Harvard group noted evidence of ionized oxygen by spectro analysis in the same area. KN6JJY passed her General Class exam. EXX and CQG, with VQV, are studying plans of circuits for 6-meter rigs before recommending any certain ones for the club building program. HC reports interest and representation on the NTS nets has picked up with all nets running full time. K6EMN has a new SX-100; K6EWG a new HRO-60. WLI reports having been on the air more during October working in the CD, VK/ZL, and DX Tests than he has for the last six months. EXX is rebuilding an exciter to get on 14 Mc. He has been active on 50, 144, and 420 Mc. K6BBD has a new 6146 rig running low power and completed his WAS by working Delaware. K6BAM is contructing a Q-Multiplier. K6GID has raised his power on the AT-1 by following the article in *QST*. New members continue to be added to NCN. EVC showed good accuracy in the last F.M.T. with 6.8 parts in one million. Traffic: K6GID 89, W6ZRJ 76, BPT 68, YHM 65, HC 50, AIT 42, UTV 42, EXX 8.

EAST BAY — SCM, Roger Wixson, W6FDJ — Asst. SCMs: Harry T. Cameron, 6RVC; and Oliver A. Nelson, jr., 6MXQ. PAM: LL. RMs: EFD, JOH, and IPW. SXK's report for October says that reception is good on 2 meters from the Hawaiian Rancher, K6GWE was heard 487.7 miles at sea; LBO and LBJ were heard in the 500-mile range. Cliff has been keeping skeds with NLZ, who is running a wheel on 144.007 Mc. Cliff claims 25 different contacts on 2 meters in KH6-Land. The East Bay Radio Club had an interesting talk on color television by George Day, representing G.E. Day talked of some of the production problems and showed an interesting movie on what is involved in producing a color TV program. A 2-meter hunt was held on Oct. 28th. Thanks to K6EHW for the information. K6DDT reports 5-meter activity is picking up with more Technicians getting equipment on the air. SUE is currently constructing 6-meter equipment. K6DDT, W6FDJ, and SUE are combining efforts in building 6/2-meter portable or mobile rigs. ITH reports 18 as his traffic count for September. Reg is doing mostly experimental work with RTTY and s.s.b. A new 1-kw. mechanical filter transmitter is on the air now. VPC reports good activity on the RTTY MARS Net on 3275 kc. The traffic count totaled 54 for the month of August and has been on the increase. The month of September showed an increase to 67 total messages handled. CBF reports shcedules on RTTY and participation in the CD Party and Frequency Measuring Tests. The Oakland Radio Club enjoyed a fine demonstration in sterophonic tape recording at its meeting held Thurs. Nov. 3rd. Nominations were made for officers for the coming year. An election was scheduled for the 1st Thurs. in December. The December meeting was a Christmas Party. The Oakland Club wishes all a Happy New Year. Traffic: W6CBF 4.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — Asst. SCMs: William T. Nakahara, 6GHI; and Fred H. Laubscher, 6OPL. SEC: NL. The San Francisco Naval Shipyard and HAMS (Red Cross) Clubs are busily

(*Continued on page 112*)

making plans for a joint dinner. BYS was host to the club members at his QTH for the Oct. meeting. Code practice plans were discussed. The Local Bay Area 6-meter group held a luncheon in Chinatown with 38 attending. Plans were made for an East Bay luncheon for any 6-meter boys interested in attending. GHI now attends the Cathay Club meetings as Asst. SCM and promises to send in monthly reports in the future. The 29ers Club had AHH as NCS for the monthly 10-meter transmitter hunt. More mobiles are turning out for this hunt each month. The Sonoma County Radio Club had BYB as speaker at its Oct. meeting. He told interesting stories about his recent trip to West Indies and South America. The Tamalpais Radio Club voted two new members into its ranks, MND, and D. Kempton as associate member. New rules regarding s.s.b. were discussed and clarified to club members. Incorporation of the Club also was discussed. SLX must be away on his yearly Naval Reserve training because his usual monthly report was not received and Ed is always faithful in sending data regarding the Humboldt Radio Club doings. The Marin Amateur Radio Club elected new officers. The Ladies' Radio Club voted to send a donation of $12.00 to the Braille Club for the blind amateurs to help finance new supplies needed by the members. The San Francisco Radio Club had TFZ as guest speaker at its Oct. meeting. Election of new officers for the year also was held. Congratulations to K6KFS, pres.; PHS, secy.; and Harry Witzke, treas. GGC still will be poker player in the San Francisco Radio Club Board Meetings as vice-pres. Congratulations to OST on the birth of Kathleen Anne, Oct. 14th, weighing in at 10 lbs. 9 oz. We dropped in to look over the new harmonic of UEV and don't blame George for crowing about George William. YC also is in line for congratulations on receiving an award from Australia WA VK CA (worked all Australia Call Area, Award No. 16). FEA is back on c.w. having no modulation for phone. The OM forgot to kill the plate on the modulator when he switched over to c.w. and burnt out two tubes and the transformer. QMO has a new Collins 75A-4 and reports that she still enjoys working as civilian operator at K6USA. PHT expects to go on the air shortly with a new Elmac in mobile. BIP made 285 contacts in 62 sections in one week end of the Oct. CD Party and says the highlight of the event was working GGC on c.w. JXK is keeping skeds with his XYL in Anchorage, Alaska. WF has a new Viking 21 VFO and mike. KJ has a new QTH at Paradise. HVN is back in San Francisco after two years in Europe with the Army. We wish a speedy recovery to K6GSG and K6HWI's dad, who suffered a severe heart attack recently. Traffic: W6FEA 65, K6HIF 45, W6QMO 32, GGC 10, GHI 4, YC 2.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — New traffic men in Sacramento: MZT, HVD, and K6EHT. MZT is moving to Redding. K6HRK graduated from the Novice ranks and now is on 75-meter phone. UCO is planning for next Field Day. K6ABY is doing a fine job with 7 watts on 3995 kc. K6GDS is active on mobile. HQF is the new EC for Sacramento and will aid JEQ. The new mobile club in Sacramento is known as the RAMS (Radio Amateurs Mobile Society) and will be AREC 100 per cent. JEQ is the owner of a 40-ft. crank-up tower and also a 20-meter Mosley beam. The Oroville Club has a net on 1910 kc. The members are K6BAI, DPS, HDP, HIU, W6BLW, DVD, and YSI. K6HIU has dropped the "N" from his call and is ready for new lands. CMA still is up on the traffic work and in no time he should be in line for a BPL sticker. The Dunsmuir Amateur Radio Club is running a class for those who desire amateur licenses, and also a class for those who wish to take the 2nd-class phone exam. JDN has been quite busy and needs a secretary to keep up with the work of this office. The General Electric Co. sent a very fine film on c.d. This was shown during the club meeting, also at the fire department and in a local hotel. It was highly commended and G.E. should be highly praised for the type of films they have. Next month we will give a run-down on the Chico Meet. Traffic: W6CMA 115.

SAN JOAQUIN VALLEY — SCM, Ralph Saroyan, W6JPU — Happy New Year!! VBQ has been appointed RACES Radio Officer for San Joaquin County. All hams in San Joaquin County interested in RACES should write VBQ, Rt. 3, Box 826, Stockton. K6AIF is building an s.s.b. rig. PGP has a Model 26. K6LYO is on 6 meters with a Communicator. IER is back on 2 meters. FGJ is on 75-meter mobile. VPV puts out an FB signal on 75-meter s.s.b. K6GMY has a Viking. K6GDI, K6HRM, W6BJI, NDP, TZJ, and NCG are on 6 meters. OWL has a new ham shack. A Marsfest was held in Fresno at the Motel Fresno Nov. 29th with 51 in attendance. JXY has moved into his new shack. WYT is sporting a new Cadillac. BAN is running screen modulation with good efficiency. Code classes for Novices are being held at Chandler Field every Mon. evening and are well attended. The Turlock gang is very active on 2 meters. TTX is operating portable at San Luis Obispo while attending college. ADB is on 75-meter s.s.b. SMS is sporting a new Dodge. NCG is designing some new equipment for 75- and 6-meter mobile for his station wagon. QFR has a new Lincoln Continental and is looking for a suitable place for the 75-meter whip!! HXR is back on 75-meter mobile. BFH is experimenting with transistors.

(*Continued on page 114*)

22 Birch Hill Road
Great Neck, N. Y.
November 23, 1955

Eldico of New York, Inc.
72 East Second Street
Mineola, New York

Gentlemen:

I thought you would be interested to know of my complete satisfaction with the Eldico SSB-100 Transmitter which I have had on all the amateur bands since approximately August, 1955. During this time, I have had the opportunity of placing this equipment through various checks of performance and I can state that it has met all of the requirements in fine style. I consider myself a hard taskmaster of equipment performance and consider the following absolutely necessary in equipment of this type:

1. Extreme frequency stability from a built-in VFO. The SSB-100 meets this requirement without question.

2. Sufficient power within itself without the use of a linear amplifier to permit successful contacts throughout the world. This equipment's rated power output of 100 watts permits the fulfillment of this requirement. I have worked all continents on SSB and have consistantly obtained 9+ signal reports from the majority of stations.

3. Overall quality of speech should be pleasing to listen to on the air, easy to tune in and yet sufficiently restricted in band width. The SSB-100 puts out an excellent sounding signal and complies fully with the above requirements.

4. A transmitter of this type should be completely self-contained, easy to tune and shift from band to band, and occupy the minimum of desk space. Once again, I can advise that I have found this equipment fulfills these requirements.

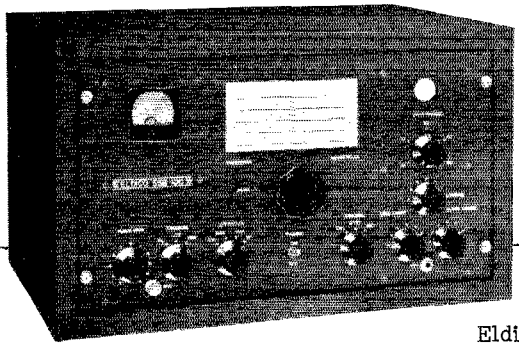
5. Lastly, its outward appearance should be such as to harmonize with the other equipment found in amateur radio stations and it should provide a positive system of monitoring modulation peaks. The appearance of the equipment speaks for itself and the inclusion of a one inch oscilloscope provides the operator with a positive means of monitoring both AM and SSB transmissions. Furthermore, the quality of the AM type transmission leaves nothing to be desired.

From the above I am sure that you have concluded that I represent one of your more satisfied customers and I feel that you have succeeded in designing and manufacturing a piece of amateur gear of which you can be justly proud.

My best wishes for the continued success of your endeavors along these and similar lines.

Sincerely yours,

Morton B. Kahn
Amateur Radio - W2KR



Eldico SSB-100
Amateur Net $695.00

EBL, Section Emergency Coördinator, requests all Emergency Coördinators to send in monthly reports. This is important, fellows. Traffic: (Oct.) W6ADB 180, EBL 18, K6BGO 10, EVM 10, CQT 1. (Sept.) K6EVM 54, W6ADB 42, K6BGO 10, W6TTX 6.

ROANOKE DIVISION

NORTH CAROLINA — SCM, Charles H. Brydges, W4WXZ. — SEC: ZG. RM: VHH. PAM: ONM. Nets: Tarheel Emergency Net (3865 kc.), Confederate Teenage Net (3950 kc.), Greensboro Two-Meter Net (146.88 Mc.), Skunk Net (29.000 Mc.), and the Charlotte C.D. Net (3865 kc.). FDP reports MARS activity along with amateur work. RRH still is looking for a 2-meter contact into Charlotte. UEG, DLX, and VHH are most active on v.h.f. in Charlotte. BEC is sporting a new Viking Ranger along with a D-104. Congrats to CEN on winning his fifth consecutive North Carolina DX Contest award. The Charlotte c.d. group took a trip to Mt. Mitchell and set up portable gear. It was wet and cold 6200 feet up, but a good time was enjoyed by all. FKT and OTW in Charlotte, QAA in Liberty, and many stations in Gastonia are active on 10 meters. DRC worked ZS6s and OXH worked a ZE6. OQQ is completely s.s.b. and won't even whisper on a.m. EC, DLX, WDJ, and DIS are just a few over the State who have switched to s.s.b. SGD is working YL Nets on 40- and 75-meter phone. In addition to YLRL activities SGD also is secretary of the Tarheel Emergency Net. BVQ has a new Telrex 20-meter beam and is working 20-meter phone. KN4BVJ is working on General Class stuff. QC had an unusual QSO with RJ. The last time was 33 years ago with a spark rig and loose-coupler and crystal-detector receiver! CVX is getting the DX on 10 meters using a 75-meter antenna. NYN was active during the phone section of the CD Party. The Charlotte c.d. net participated in the Civil Defense Evacuation of Charlotte. A transmitter was atop the Johnson Building in the downtown area and mobiles were scattered over the city. Hope you all had a very Merry Christmas and a Happy New Year. Traffic: (Oct.) W4RRH 26, QC 4. (Sept.) W4RRH 33, FDP 28, BEC 10.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — ZIZ reports into the Early Bird, Florida, and MARS Nets. DYP is ironing the bugs out of his new 500-watter. FM has his mobile receiver installed and working and now is working on his mobile transmitter. The following reported into the South Carolina C.W. Net during October, with the number of QNIs indicated: CHD 13; ANK and KYN 9; AKC 7; K4ADQ 6; PFH 5; YAA/3, W9JBN/4, QCC, HBY, RPV, SOF, and ZRH 2; FFH, TTG, K4AVU, KTI, SOY, and W1TNO 1. AKC is Route Manager and invites all South Carolina amateurs to report into the South Carolina C.W. Net on 3795 kc. at 7 P.M. Mon. through Fri. ANK received another report of 3 parts per million as a result of the last Frequency Measuring Test. I am doing overtime on this SCM job awaiting the election of a new SCM. Thanks for your fine support and I am sure the new SCM can count on your continued coöperation. Traffic: W4ZIZ 97, AKC 23, DYP 13, ANK 12, FM 7.

VIRGINIA — SCM, John Carl Morgan, W4KX — SEC: RTV. The VSN boys are complaining about the scarcity of "customers." Newer hams will find VSN an ideal way to "get feet wet" in traffic net operation. Y'all come. SHJ was invalided home from his "tin-can" for several weeks; VN sounded like old times. TYC/3, now in Washington at CREI, is helping to keep VN rolling. YZC is back on QRO in the new QTH, and needs only one QSL for DXCC. KFC racked up No. 229, and worked 95 countries on 20 meters during the Oct. 28–30 DX tests. JUJ worked his 129th country. IA finally is chasing DXCC after 30 years on the air. He now has more chance at the rig with jr. operator TFX off at G.W.U. in Washington. IF has been DXing in person. He visited HI6TC while in the Dominican Republic. PHL handled a raft of traffic during Hurricane Ione. The Danville Club manned a station at the local fair. AQA reports CPN is back in civvies. He was DL4DS while in Germany. CZB is convinced his receiver has termites. 3QQE is complaining that things are slow — he handled only 744 in October. The Richmond Club now is sponsoring a technical training program. YVG sends a photo of the new mobile. Drool! KAO is dismantling to move to a new QTH. K4BIM is operating mobile while at U. of Va. DYV moved to Alexandria. Petersburg's first YL hams are Bess DuPuy, KN4EUU, and Joyce William, KN4EUW. AQA sold his house and is living in a trailer pending completion of his new wigwam. Traffic: W4PFC 744, SHJ 178, K4DBC 103, W4PHL 87, BYZ 62, CGE 56, KRR 45, YVG 26, CZB 16, AAD 12, TYC/3 12, KFC 7, BRF 6, WIN 4, AQA 3, KN4DKA 1, W4IA 1, ZM 1.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: GEP. PAMs: FGL and GCZ. RMs: DFC, GBF, HZA, and JWX. LGB and HTU are doing very well on 10-meter phone. ORD, CLX, RFD, GCN, and EOJ are on s.s.b., all doing good jobs. BDD, CLX, and PQQ have new Collins 75A-4 receivers. GBF did so well in the last QO Frequency Measuring Test that one would think he was

(Continued on page 116)

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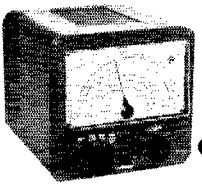

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Kit Price $49.95

★ Extremely Stable ★ Built - in Power Supply ★ Completely Bandswitching ★ Calibrated on 160, 80, 40, 20, 15, 11 and 10 Meters. ★ Output On 160 and 40 M. Calibrate Switch for Zero Beating ★ Full Range Vision Dial.

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Completely Bandswitching Transmitter

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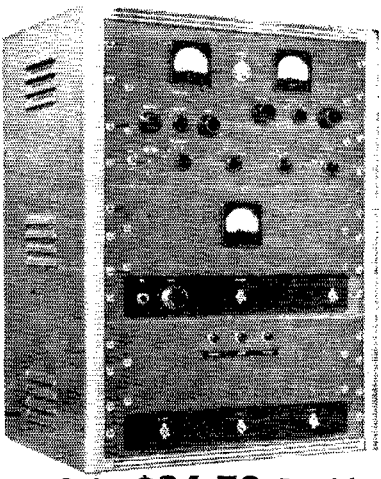
★ Completely bandswitching, 10 thru 160 meter bands.
★ Provisions for VFO operation.
★ Pi network matches antenna from 52-600 ohms.
★ Completely TVI-Screened & by-passed.
★ Provisions for Single Sideband input & operation.



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using FCC equipment. SNP and REH also participated in the same Test. RFD, HZA, PQQ, LSG, QVS, SNP, HYX, IAK, IDH, and WN8DEY, all members of the Kanawha Radio Club (ex Tri-City Club), recently applied for AREC registration. It would be fine if other clubs would push AREC registration in the same manner. NBG is hunting for a 3-5 kw. gasoline power unit. Does anyone have ideas as to where he may be able to get one? If so, please drop him a line. 3UVD is asking for assistance from some ham in the Morgantown Area to relay Weather Bureau information. If anyone can give him assistance, please drop him a line. WN8GHN, of Fairmont, is the son of DXer 9FNR. Both nets are doing a fine job. WDP, of Rainelle, plans to get on the air very soon. He is in the process of getting equipment together and set up now. NYH did a good job in the recent CD Party. BWK now has a new antenna in use. Traffic: W8HZA 68, PZT 27, BWK 21, IXG 20, DFC 16, NYH 9, UYR 4.

ROCKY MOUNTAIN DIVISION

COLORADO — Acting SCM, Carl L. Smith, WØBWJ — SEC: MMT. RM: KQD and MYX. PAM: IUF. Reminder to traffic-handlers: You are welcome and needed in HNN, CSSN, CWN, and the Emergency Phone Net. Check time and frequencies in the *QST* net directory or this column of last month. Colorado operators now hold 12 of 21 skeds in TCC for the Pacific Area. Colorado is leading the activity in NTS for the mountain states area. MYX needs NCS and Alternate NCS for all nets. YMP is giving a big hand, but let's have some volunteers. Also needed is a net reporter. Anyone interested? KQD represented Colorado at the Midwest Division Convention in Omaha. She was presented with an A-1 Operator certificate by 1NJM. Congratulations, Irene! LZY is back from vacation. The El Paso Radio Club reports the election of MEY as pres.; and ZDI, secy.-treas.; MYX was appointed act.-mgr. YNB and YNC have moved to W6-Land. SGG is altering his antenna tuner for 80-meter operation. VLX has a Globe King on the air and SWS is wiring a DX-100. UPT stopped his attack on the Rapsco Contest long enough to take on a new 75A-4, and JVR is back on the air with a "V" beam. October net summaries show HNN with 368 reporting and handling 231 messages in 23 sessions; CSSN with 62 reporting and handling 30 messages; CWN with 406 reporting and handling 406 messages in 27 sessions. BPL was made by KØWBB and WØWGB. Traffic: KØWBB 928, WØKQD 454, WGB 220, AGU 76, NVU 35, DRY 33, HOP 30, LEK 23, TVB 12, NWJ 9, SGG 6, BWJ 5, SKK 4, YPE 4, SWK 2.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — LQP has burned out his modulator transformer and is off the air again. The Ogden Club is incorporating and appointing a property manager. SAZ says that LQE and GPN are most active in CD business. QAG and WN7YZD were married Aug. 26th. JPN advises that Salt Lake City c.d. drills have been resumed. Drills are held every Wed. at 7:30 P.M. using RACES frequencies. QDJ has a new five-element beam for 6 and an eighteen-element for 2 meters. Vic is a student at Weber College. QWH is having constructional difficulties at his home QTH but will be back in circulation shortly. NIB, BLE, QYC and many others may be heard almost any morning at 7 A.M. on 3935 kc. This time and frequency is nearly as popular as the FARM Net time is in the evenings. MARS nets have been reorganized. The Utah Net frequency is 4820 kc. at 0100Z Tue. and Fri. with AA7WBD (W7JJD) NCS. Traffic: (Oct.) W7JPN 5, UTM 2. (Sept.) W7QWH 2.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — SEC: TKL. RM: KIX. PAM: WOG. Asst. SEC: COU. Station appointees are urged to check the expiration date of appointments and, if still active, have them renewed. The Decatur Club now has a membership of 21 members, owns an emergency power plant, and is quite active. PKA reports that K4ENZ is now General Class and W5EMZ/4 is busy on 2 meters while TCB is trying his hand at s.s.b., but will shortly leave for Spain where he will be associated with RCA. FXZ has a kw. s.s.b. under way while PKA is busting the ether with a flea-power six-watter. He reports very good luck with the 2E26. WAZ did an excellent job on the photo album of Alabama hams. The Anniston Club holds code and theory classes each Tues. and Thurs. nights at the "Y." NZM has a cubical quad on 20 meters and is DXing. WHW is busy on MARS. TXO has gone high-power — a half-watt on 10 meters for local contacts! K4AJG sticks to 40 meters week days and tries 75 on week ends. The Tri-Cities now boasts nine AENP members and three regulars on AENB — a record. CRY has moved and is working on beams for 10 and 15 meters. The St. Bernard Club is under way again with GUR, pres.; K4ASJ, vice-pres.; and K4BJY, secy.-treas. Traffic: (Oct.) W4UHA 129, YRO 109, HRK 100, KIX 74, RLG 73, WOG 61, DTT 48, ZSQ 34, K4AOZ 29, W4EJZ 25, USM 25, AVX 21, ZSH 18, K4AJG 16, W4TXO 14, CAH 13, YAI 11, OAO 9, CNU 6, K4BSV 5, W4EWB 4, CRY 3. (Sept.) W4UHA 42, NZM 24, USM 17.

(*Continued on page 118*)

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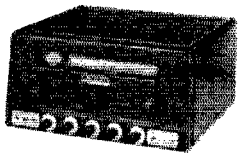


The NEW

HAMMARLUND PRO-310

Amateur Receiver

Designed by Hammarlund as the last word in amateur receiver performance, the new PRO-310 has a newly developed front end with three tuned circuits but only one RF tube amplifier, providing remarkable selectivity and ultra-high signal-to-noise ratio. Other features include sectionalized construction and exceptional stability under all operating conditions. Accuracy is emphasized by frequency readings correct within 1 part in 5,000 and continuous bandspread calibration over the entire range.

Complete with tubes..... $595.00
Matching 6½ in. PM speaker..... 18.50

COLLINS

Model 75A-4 RECEIVER

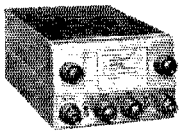
Designed for AM, CW and selectable SSB reception. Covers 160, 80, 40, 20, 15, 11 and 10-meter bands. Features include: double conversion . . . permeability tuned, hermetically sealed VFO . . . mechanical filter in IF strip . . . separate detectors for SSB and AM . . . band-pass tuning . . . new noise limiter . . . bridged-T rejection notch filter . . . built-in crystal calibrator . . . provision for 3 Collins plug-in mechanical filters.

Complete with tubes (less speaker) $595.00

Model 312A-1 control/speaker for above in matching cabinet..... 37.50

ELMAC

NEW



PMR-7 Receiver

New Slide Rule Dial • Improved Sensitivity, Selectivity and Signal-to-Noise Ratio • 7 Bands—10, 15, 20, 40, 80 and 160 m. plus Broadcast • Dual Conversion • Variable Beat Frequency Injection for SSB Reception..... $159.00

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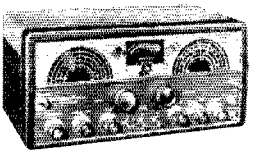
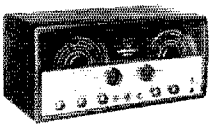


Model SX-100

Selectable Side Band Receiver

Features selectable side band operation; "Tee-Notch" filter, that provides a stable non-regenerative system for the rejection of unwanted heterodyne, produces an effective steepening of the already excellent 50 KC i.f. pass band (made famous in the SX-96), and further increases the effectiveness of the advanced exalted-carrier-type reception; notch depth control for maximum null adjustment; antenna trimmer; Plug-in laboratory-type evacuated 100 KC quartz crystal calibrator; logging dials for both tuning controls; full-precision gear-drive dial system; crystal controlled second conversion oscillator for greater stability and additional temperature compensation. Frequency range 538 kc-1580 kc, 1720 kc- 34 mc.

Model SX-100..... $295.00

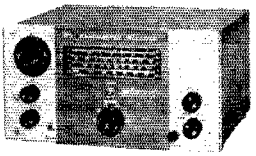


S-85 Amateur Receiver

Featuring over 1000° of calibrated bandspread on the 10, 11, 15, 20, 40 and 80 meter ham bands for better selectivity, the newly developed S-85 is equipped with a separate bandspread tuning condenser and a built-in 5-inch PM speaker. The dial is extra-large and easy to read. Coverage includes the 540-1680 kc broadcast band plus three shortwave bands from 1680 kc to 34 mc. Cabinet is gray-black steel with brushed chrome trim.

S-85 (AC) or **S-86** (AC/DC) $119.95

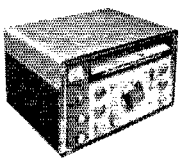
HARVEY-WELLS



Model R-9 Receiver

Double conversion—6 bands: 80 thru 10 meters—9 tubes—S-meter—self-powered for AC.

Complete with tubes, less speaker..... $149.50



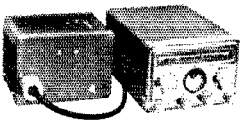
The NEW

NATIONAL NC-300

"Dream" Receiver

Result of National's world-wide contest with prizes for best suggestions for a "dream" receiver, the NC-300 incorporates all the most-wanted features submitted by many thousands of hams. 10 dial scales cover 160 to 1¼ meters; the slide-rule dial is longest ever, readable to nearest 2 kc without interpolation up 21.5 mc; tuning is super-smooth with high-speed inertia-tuning dial with 40 to 1 ratio; the "S" meter is extra-large and easy to read. Sensitivity is at a new high, with 3-6 db noise figure from 160 to 10 meters. Dual conversion results in better than 50 db primary image rejection on all amateur bands, plus better than 60 db secondary image rejection. Optimum bandwidth is available for all operating conditions with versatile front-panel I.F. selector giving 6 db drop at .5, 3.5 or 8 kc. Separate linear detector for single sideband insures low-distortion operation. Finish is two-tone gray enamel.

Complete with tubes..... $369.95



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Mobile Receiver

Here is the mobile receiver answering every possible requirement, with performance comparable to that of a top-quality communications receiver and of equal quality on 115-volt AC power lines or 6 and 12-volt DC battery power. Covers broadcast band up to 160 meters, plus the 80, 40, 20, 15 and 10 meter bands, each amateur band individually calibrated and spread across the easy-to-read slide-rule dial scale. Design includes double conversion, beat frequency oscillator and other top features.

G-66 less power supply..... $169.50
3-way universal power supply and speaker unit..... 39.95

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EASTERN FLORIDA — SCM, Arthur H. Benzee, W4FE — SEC: IYT. Gainesville: The Gator Amateur Radio Club has been reactivated. Officers are OWX, pres.; GPP, vice-pres.; VTO, secy.; K4BKU, treas.; K4AKR, act. mgr. St. Petersburg: The SPARC enjoyed a hamfest at the home of WPD/UFR with 80 in attendance from various points in the State. BNM now is living in Austin, Tex. TXX and his XYL, KN4CUY, have moved to Knoxville, Tenn. Melbourne: BWR is back with a kw. Alachua Co: Seven mobiles drill every Tue. at 1930 hours on 29 Mc. Sarasota: WHF and UKE used 2-meter rigs at the Red Cross and C.D. Hq. during the S.E.T. Key West: K4BOF is now Conditional Class and has returned home to Pensacola. The Tropical Phone Net is now over two years old and meets daily on 3945 kc. at 1730. PJU is net mgr. The Net has good coverage of the State but would like stations in West Palm Beach. The Palmetto Net has reelected LAP as net mgr. The Knights of the Kilocycle celebrated its 500th postwar meeting with a hamfest at Leesburg on Oct. 30th. LVV was on TCRN for six hours during Hurricane Ione. *Note:* Let's get our station activity reports in and on time. They must reach me by the morning of the 7th of each month. Many stations whom I know are handling traffic do not report. If you need forms, let me know. Traffic: (Oct.) W4PJU 142, LMT 92, IYT 66, WS 54, ZIR 39, RWM 31, FE 26, YNM 23, BWR 22, EHW 7, WEM 4, WHF 2. (Sept.) W4YJE 36, LMT 34, LVV 4. (Apr.) W4BWR 109.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. ECs: MFY and HIZ. AKP turns in another FB traffic report. ZFL and HBK have been working hard putting Pensacola High School station, K4AFF, on the air. KN4EEG is heard on 75 meters. K4AKP, of Tallahassee, turns in a first report from there. TTM is QRL the Garden Club. PTK is out of the hospital and feeling OK. YES is a proud papa. NJB is now an NAS inspector. K4CRK is working all bands with a Ranger. 5LV/MM makes port here often. PAA has the new tower up and is giving 15 meters a fit. HJA has a new 10–20 beam and a kw. final. FHQ has a new Signal Slicer in the shack. DAO/DEF joined the Old Timers Club. AKJ has moved into the Pensy area with a kw. of c.w. on 80 meters. UUF is finishing an FB 2-meter rig. FDL is back with the CAA. K4DDD is monitoring and baby-sitting. JPD is dusting off the rig with the cool WX coming in. BGG has an antenna up for 15 meters. K4AH has the Elmac perking FB. UCY is experimenting with antennas. CCY is twirling the dial on a 75A-4 and hunting bigger and better DX. AXP and VR keep 40-meter c.w. hot. MS enjoys s.s.b. K4AGM, a YL, is working on a 6-meter rig and doesn't want to be called OM. PQW gets on when the spirit moves him. A splendid hamfest was held by the EARS group in Ft. Walton. EQR is QRL 8 mm. movies. CQX wants more power. PLE has an FB harmonic at his house. CPE wants a Panadapter. CDE is heard regularly on 75 meters. QK meets the Gulf Coast Hurricane Net. UC renewed his ticket. 3SDW/4 is operating mobile in the area. SMM is mobile. Happy New Year, gang. Traffic: (Oct.) K4AKP 342. (Sept.) K4AKP 421.

GEORGIA — SCM, George W. Parker, W4NS — SEC: CFJ. PAMs: ACH and LXE. RMs: MTS and OCG. Nets: Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0800 and Tue. and Thurs. at 1900 EST. Georgia State Net (GSN) meets on 3590 kc. Mon. through Fri. at 1900 EST. ZUF has a new beam for 20 meters. FZO is putting up a quad for 15 meters. FYC is running a full kw. on 75 meters. A new club has been formed in Taccoa called the Stephens County Radio Club. It meets the 1st Mon. of each month. BQU is teaching theory and code to those interested there. MA is back on the air after a bout with the doctors. LNG is out of the Army and on 2- and 10-meter mobile. ZWT and BWD are back after a vacation in Pennsylvania. IMQ is temporarily inactive because of a job change. CFJ has a new sixteen-element beam for 2 meters. TJS now has a full kw. in sideband and a new NC-300 receiver. CEY is the secretary of the new club in Thompson. HRR has a new KWS-1. K4AFP is General Class in Hapeville. New officers of the Atlanta club are MV, pres.; NS, vice-pres.; HYW, secy.; NWK, treas.; LXR, act. mgr. New appointments: BGB, FWP, ZDP, and YEK as ECs. WKP as OPS. GMP, ex-YU1GM, is back in the States and is now at Mare Island, San Francisco. EDI has a new bird and her OM, ECE, a new Globe King. NS spent a week in Detroit, Mich., and visited with W8s SPF, MGQ, and SWI. Your SCM wishes you all a happy New Year and lots of DX. Traffic: (Oct.) K4WAR 820, W4PIM 152, DDY 137, CFJ 59, K4BAI 37, W4ZDP 32, ZUF 31, NS 20, IMQ 6, BWD 2. (Sept.) W4FYC 277, K4BAI 31. (Aug.) W4DDY 95.

CANAL ZONE — SCM, Roger M. Howe, KZ5RM — The KZ5 gang had a peak at Yucca Flats and one of the A-bomb tests when Mel Millard, one of the Panama Canal's Safety Engineers, gave a very fine talk on his trip to witness a test and showed some of his excellent color slides of the test area. Len Collett, ex-WØDEA, is now KZ5LC and already has made application for ORS appointment. Robert Austin, the son of W7AXJ, is working on the code under BE, Danny Weil, VP2VB/P, has resumed his voyage

(Continued on page 120)

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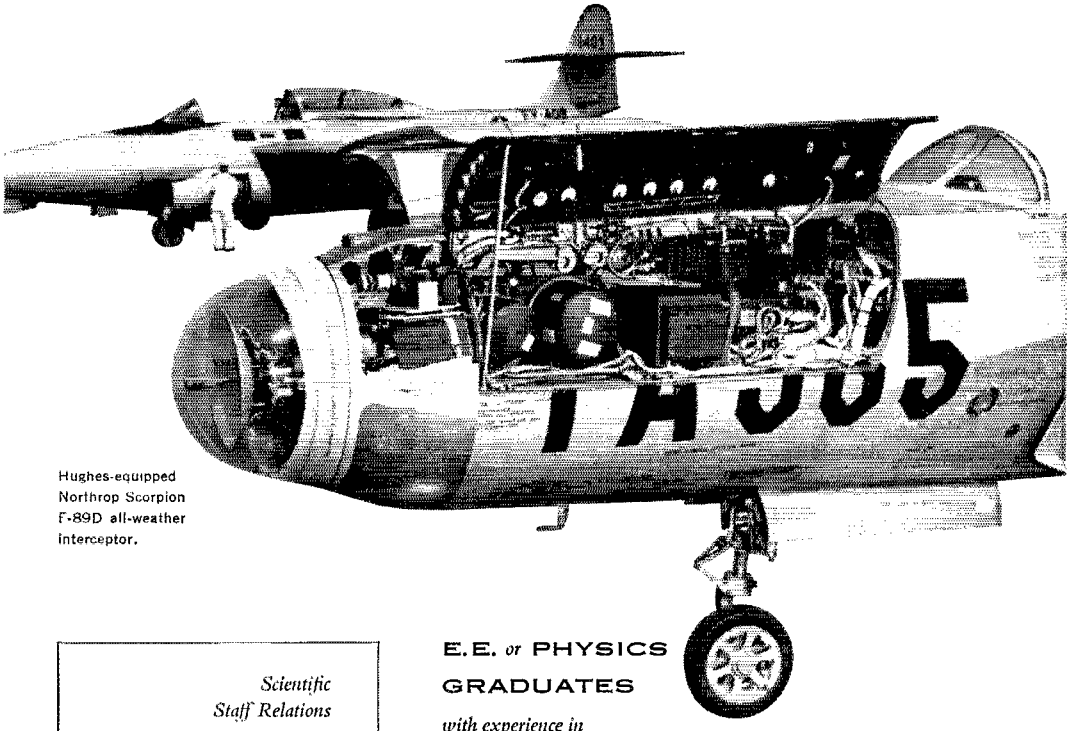

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around the world in the sloop *YASME* and was last reported near the Galapagos Islands. The HGs are the proud parents of a daughter. GH has a new NC-300 on order. WZ is selling his entire station and going s.s.b. on 20 meters. New calls issued during the month are: JS, James S. Branch; LC, Len Collett, and PC, Preston C. Gardner, jr. Traffic: KZ5VR 162, WA 132, KA 39, BR 12.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, William J. Schuch, W6QMN — Asst. SCM: Albert F. Hill, jr., 6JQB. RMs: K6DQA and W6BHG. PAM: PIV. K6BGE has moved to a new QTH and soon will be back on the air. CBO is sporting all-band antennas and is really going to town. VSK spends most of his time on 160 meters. AM, with QMC, KFV, OZ, and YMD, racked up a nice score in the DX Test. K6HBA is DXing now. K6IQF and W6QXH teamed up in the DX Test. K6BEQ is very QRL school. K6COP is back on his feet after a spell in bed. K6DDO has made WAC. LPV is splitting time between traffic and DX. The Beachwood Amateur Radio Club meets at the Hollywood Playground and is looking for teen-age members. NTN is QRL c.d. and OBS. K6BWD notes many of the gang are slipping outside the bands. WT still is QRL 144-Mc. traffic. The Rio Hondo Club recently won a prize with a float in the Pio Pico Days Fiesta. KN6LFT, KN6MYF, K6IRY, and K6KSS took 144-Mc. gear to the Salton Sea Boat Races. New General Class licensees are K6s INM, LBE, HJK, and HJR. New KNs are ONU and MVJ. K6KCI is added to the list of stations using parakeets to call CQ. Ham radio is going to the birds. A new member of SCN is K6OIZ. GJP is the proud grandpap of twins. K6EXQ is doing FB on DX. JQB is working traffic in spite of being on the road most of the time. QGX is turning in a nice traffic count monthly. K6EJT is recovering from a back injury. BHG reports skip is making 80-meter traffic rough. GYH is QRL on TXN. USY makes BPL. Congrats, LYG is QRL on MCAN-4. K6HOV made BPL. K6IYF is the TVI committee chairman. KP will move to the beach soon. The Rio Hondo Club is running code classes. The mail QTH is P.O. Box 25, Whittier. Traffic: (Oct.) K6HOV 762, W6LYG 312, USY 223, GYH 169, BHG 154, K6EJT 132, W6QGX 102, JQB 58, K6DQA 57, W6CAK 40, GJP 16, K6OIZ 13, ELX 11, KCI 9, BWD 6, IYF 6, W6WT 6, LPV 4, K6NTN 4, DDO 3, COP 2. BEQ 1, IQF 1, W6LVQ 1. (Sept.) K6FCY 392.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH, and Dr. John A. Stewart, 7SX. SEC: VRB. PAM: KOY. RM: PKW. Arizona Phone Net: Tue. and Thurs. 7 P.M. MST, 3865 kc. Arizona c.w. Net: Tue. and Thurs. 8 P.M. MST, 3690 kc. c.w. Net daily Mon. through Fri. at 4 P.M. MST on 7115 kc. Cochise County has established the Cochise County Emergency Phone Net, with 25 member stations, on a frequency of 7210 kc. and meets every Sun. at 9 A.M. MST with AMM as NCS. The Fort Huachuca Radio Club elected the following officers: ASI, pres.; BCM, vice-pres.; SNL, secy.; KOL, treas. The Club meets at the Civilian Club Building on the 1st Mon. of each month at 7:30 P.M. MST. The Maricopa County V.H.F. Club elected the following officers: OSM, pres.; KYE, vice-pres.; YWD, secy.-treas. Club membership includes the following: KPB, LED, LKT, OQF, PHT, QNO, QZZ, RUX, SUJ, TKH, UCU, VLN, VMO, VMP, VZI, ZPA, ALC, MJN, VYM, ZHB, ZIA, YUK, AYU, and VMQ. The Club meets on 29.610 Mc. the 2nd and 4th Wed. at 8 P.M. MST. New calls: Conditional Class BAK and Novice Class AYE. A Maritime Mobile certificate was awarded to PEY for his 30 M/M contacts. We now have a WAA (Worked All Arizona) certificate. The SCM will issue same to any station sending to him the QSL cards indicating contact with one station in each of the 14 counties of the State of Arizona.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Thomas H. Wells, 6EWU; Roy R. Maxson, 6DEY; and Richard E. Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DLN, HFQ, HIL, HRI, IBS, KSI, KUU, UGM, and WYA. OBSs: K6BPI, DBG, W6LRU, MUJ, OZO, QBN, UGM, and WYA. OESs: K6BTO, W6DEY, and WNN. OOs: W6SK, BKZ, CAE, CRT, GBG, LRU, MCY, QBN, UGM, and K6BOR. OPSs: W6CHV and IAB. ORSs: W6BAM, CRT, FCT, IAB, and IZG. The Fullerton Radio Club has elected SCO, pres.; GAT, vice-pres.; ECV, secy.; K6HCI, treas.; Board members are DGZ and JTV. Charlie Parker, of the San Diego JC and Vocational School, gave an interesting talk recently at the Helix Club on transmission lines. The Convair Club installed a tri-band beam for 40, 20, and 15 meters. BJ was a recent speaker at a Coronado Club meeting. XE2BC, AJ, and WC were visitors. VQE, ex-JA2HB, is now in San Diego. K6GQS is a new member of the Upper-Ten Club. ZSC, the Naval Air Station Amateur Radio Club, has moved to a larger building and is expanding operating facilities to include three positions. NDB is the trustee. Present members include NBD, RET, IGD, HFX, LBE, K6JXK, and K2AJY. 9TCJ, ex-W6NRM, was a recent visitor in the Tustin-Santa Ana Area. K6BTO is looking for someone interested in Klystron tubes. He has a BC-1277

(*Continued on page 122*)

HERE'S HOW HARRISON CAN HELP YOU HAVE A HAPPIER NEW YEAR!

I offer you the best of equipment, the best of service, the best of deals, the best of everything ... to make 1956 bring you even more operating pleasure and satisfaction!

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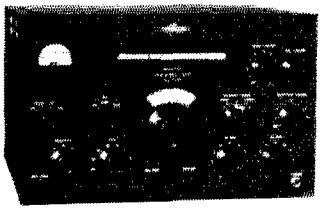

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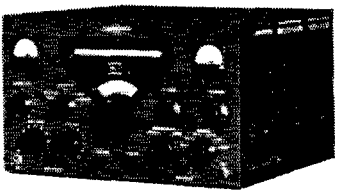
COLLINS

75A-4 and KWS-1 FROM OUR STOCK!



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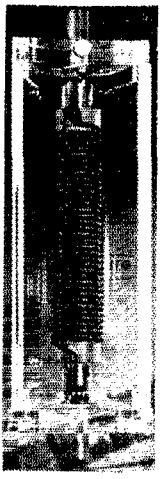
Complete with high-efficiency coils for 80, 40, 20, shorting bar for 10, and full instructions. **$22.50**



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With this compact device you can make your mobile antenna system present a 52 ohm impedance to your coaxial cable, for easier loading and more efficient output. Simple adjustment by rotating calibrated cap. **$7.95**

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To get your mobile or beam antenna system "on-the-nose", **RENT** a Harrison Power Peaking Package (Millen Grid Dipper, Antenna Bridge, etc.) Improved output can be worth many times the modest rental cost!

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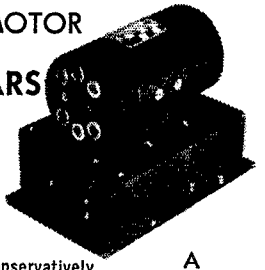

Everything you need for a complete mobile installation, all in one compact unit! Starting relay, RF hash filters, choke and oil condenser audio filters, fuses, latch lock connector, 5½" x 8½" snap-lock mounting plate. 6" high overall. Weighs 13 lbs.

Made for U.S. Navy, and conservatively rated to deliver 425 volts at 163 ma, you can draw a lot more in amateur intermittent service.

Brand new, with plug, and diagram of complete typical ham mobile installation from battery to whip! Item RO-14.

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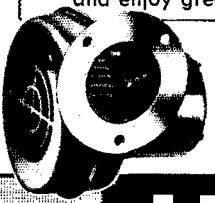

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and wants to get some use out of it. K6DQI, ex-WØWTK, is operating all bands from San Diego with a DX-100 and a Z-match. The National City and Chula Vista gangs, under their ECs HFQ and HRI, did a bang-up job in the recent S.E.T. drill. CAE and GBG continue to turn in excellent results in the ARRL F.M.T. OME has a 75A-4 to help find DX. KSM worked more than 130 countries on 14-Mc. c.w. in his first six months of DX chasing. BGX also is knocking off good DX since putting a three-element beam on top of a new 48-ft. tower. SEG continues to lose his beams to the wrath of the elements. Both IBS and BYE, dyed-in-the-wool 2-meter men, have been heard on 14 Mc. The SCM notes the absence of traffic reports from a number of stations known to be handling traffic. Let's get those reports to the SCM by the 7th of the month. Traffic: W6IAB 2753, K6DBG 44, BTO 28, W6CRT 2.

SANTA BARBARA — SCM, William B. Farwell, W6QIW — New appointment: ISQ as ORS. New ham: KN6MTL, of Ventura. The City of Paso Robles AREC, headed by EC FYW, was the only group in the Santa Barbara section taking part in the S.E.T. exercise in October. REF was confined to the hospital but now is well on the road to recovery. TTX, of Mohave, and TVV, of Avanol, are attending Cal. Poly. We understand there are more than 60 hams in this school and the school station is BHZ. AGO is the new president of the Paso Robles Radio Club. FYW is experimenting with a 200-watt grounded grid amplifier. ENR is building new frequency-measuring equipment. DTY built a new VFO rig. DYQ, MSG, ENR, NKT, and YCF did excellent in the last ARRL Frequency Measuring Test. Traffic: (Oct.) K6NBI 115, W6KLR 30, QIW 10, FYW 9, JPP 9, K6KPU 9, W6YCF 3, ORW 2. (Sept.) W6ENR 16.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Cecil C. Cammack, W5RRM — PAMs: TFP and IWQ. RM: PCN. 1NJM, National Emergency Coördinator, from Headquarters, spoke to the Dallas Club and visitors on emergency and traffic organization and operation. Director CF drove more than 2000 miles, accompanying 1NJM on other engagements in the division. PCN reports that the Panhandle ARC has swell new meeting quarters in the Telephone Building, Amarillo. KPB is rebuilding and has a new Ranger on the air. About 850 registered for Amateur Day at the Dallas Fair and YL WN5JLX won the SX-100. UTB reports an enrollment of 22 in the Sherman Club Novice Class. TGW has added 2-meter equipment to his station. LGY and PWS each have new HQ-140X receivers. DTD and FDR have a new ham shack. NWY is the new physics professor at Texas Tech. RHP reports the October attendance as 69 per cent for the NETE Net. The East Texas ARC has a new DX-100. ZTB, FIP, FIT, and FIS conducted a successful simulated emergency test in coöperation with the Red Cross, the Sheriff's department, and c.d. in Mills County. KN5COH is a new Novice in Goldthwaite using an AT-1 and S-40B. DTA/5 has gone to the Far East for 6 months and will be missed on the traffic nets. YPI has a 500-watt final on the air. TFP had a fire in his mobile transmitter. JQD went to Colorado on a hunting trip followed by a visit to Central Texas. KTX, in Lubbock, worked the Dallas-Ft. Worth Area on 2 meters and heard Houston. Over 100 registered at the Terry County ARS Hamfest and enjoyed a swapfest, guessing contest, prizes, and refreshments. Traffic: K5FFB 341, W5DTA/5 237, FNV 223, KPB 215, BAT 164, AHC 162, BTH 155, BKH 126, SMK 84, FCX 46, ASA 28, TFP 28, RRM 20, PAK 19, CF 16, YPI 5, OCV 4.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. RM: GVS. PAMs: PML, SVR, and ROZ. New officers of the Enid ARC are KN5CDE, pres.; WN5KHS, vice-pres.; PCQ, secy.-treas. The Tulsa ARC Hamfest held Oct. 23rd was a huge success and it didn't hurt any that 5KY and his XYL, IVA, held open house the night before. AGM has resigned as president of the Aeronautical Center ARC of Oklahoma City. New hams in McAlester are K5CAK and K5CEJ. The Bartlesville Club held a hidden transmitter hunt, won by MQV. Oklahoma City news: TQG has gone s.s.b. RDI has a signal slicer. KCG and KHJ have General Class licenses. TMY now is in a new shack with room to move. RST has a new receiver and had to go back to a Command receiver for MARS contacts. It looks like there might be more than one candidate for the SCM post in Oklahoma and your present incumbent will be glad to transfer the job to whoever is elected. I am sure an adequate successor will be elected. The hamfest that was planned by the ACARC for December has been postponed until after the holidays. We expect shortly completion and approval of a state-wide RACES plan now being worked out by KY with the State C. D. Director. Was sure glad to meet and talk with George Hart at the Aeronautical Center. Traffic: (Oct.) K5AOV 88, W5FEC 39, CBY 38, MRK 35, ADC 32, MFX 27, KY 26, PNG 22, EHC 21, LXH 21, GXH 16, CFG 13, REC 11, PML 10, SVR 9, MGK 7, PAA 2. (Sept.) K5AOV 15.

SOUTHERN TEXAS — SCM, Morley Bartholomew,

(Continued on page 124)

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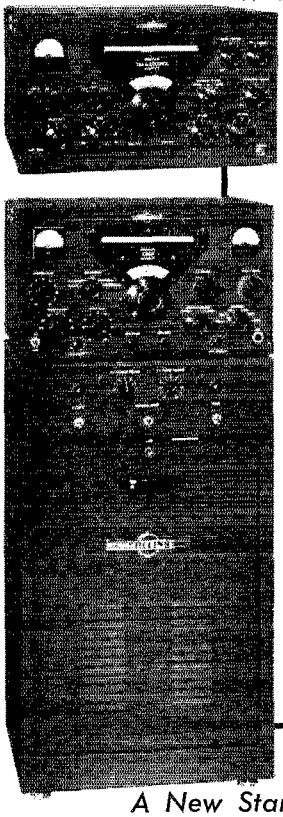

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W5QDX — SEC: QEM. FQA is organizing a Novice emergency net on 40 meters. THU has put up a windmill tower for new antenna systems. OWS has a pair of 813s going now. ZWR has been working plenty of 15-meter DX. FXN has worked 187 countries and has confirmation on 176 of them. K5ABW has his General Class now. Jim worked 33 countries and 46 states while a Novice. K5ABV also got his General Class license and a new NC-300. TFY has been after DX on 10 meters. DKK has put up a 20-meter beam. Fellows, you are not sending in your activity reports. Please send in your news for this column. Traffic: W5TFY 148, ZWR 58, K5BYN 4.

NEW MEXICO — SCM, Einar H. Morterud, W5FPB — The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST, Sun. at 0730; the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700–0830 MST; the NM C.W. Net meets on 3633 kc. daily at 1900 MST. It is with regret that we announce that FJT has joined Silent Keys. FHP, FVY, GWJ, GXU, LEF, NSN, PDY, UAF, UCX, UWA, VDY, and ZSL furnished communications for the sport car races at Ft. Sumner Oct. 9th. SUY has been installing a new 5-kw. transmitter at KGAK. GYS is building a new house. QNT and JWC have moved to Farmington from Texas. PBV is building a two-band mobile for his truck. SB and SGC are busy with a TV installation. NSV got a write-up in the local paper for organizing the first C. D. Sky Watch in New Mexico. The Los Alamos Caravan Club is active on 28.624 Mc. KN5CSE is new at Los Alamos. DWT blew the final in the CD Party. GEM has a new 70-ft. antenna. KKW worked 8 states on 1-watt output. KCW moved to Albuquerque. DRA underwent surgery. Traffic: (Oct.) W5CEE 28, DWT 17, GEM 13, K5FEF 8, W5KKW 8, BZB 7, AKR 5, ZU 5. (Sept.) K5FHU 54.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCMs: Fritz A. Webb, 1DB; and Aaron D. Solomon, 1OC. SEC: RR. Fredericton Area amateurs recently conducted a simulated emergency test which impressed local c.d. officials. The Cape Breton Emergency Net also conducted a successful S.E.T. Bouquets to FH and gang. YM is on from Moncton. UV is building a new shack. WB is active with a mobile set-up, and reports the next VE1 Contest is scheduled for January. Congrats to BN on having an average accuracy of 27.2 parts per million in the Sept. F.M.T. LB, ex-VE1FY, is now in Liverpool. CJ, the XYL of YX, is at Normal College in Truro. XN and ADT are active from Acadia U. The Keith Rogers Memorial RC officers are PE, pres.; ACL, vice-pres.; IA, secy.-treas. BZ is doing well with an s.s.b. rig. AK is active on 80- and 40-meter c.w. W4BRP, W1WOU/m, VO1AB/m, VO1AO/m, VO1B/m, VO1T, VO2I/m, and VO1D did an FB job during the Hurricane Ione emergency. 2L is ex-VO1AQ. New calls are 1J and 1Q. 1D joined the RSGB. The Goose Bay ARC officers are VO6I, pres.; VO6AB, secy.-treas.; VO6U, public relations. The VO6 QSO Party winners were: VO6U first, VO6N second, and VO6AB third. 6S has gone to U.K. for a year. 6B is on a trip to Israel and the Holy Land. 6R returned to VE2-Land. Traffic: VE1FQ 257, FH 204, AV 96, VO6U 88, VE1AO 78, FR 63, VO6AH 57, VE1OM 30, ZB 28, YO 21, ME 20, KZ 19, CS 14, JA 14, XD 11, DS 9, PF 8, HJ 7, OC 7, ZO 7, AEB 6, ABT 4, BN 4, DB 4, KF 4, PK 4, NY 3, ST 3.

(Continued on page 126)

SECOND ANNUAL VE1 CONTEST
January 28–29, 1956

All VE1 amateurs are invited to participate in a contest sponsored by the New Brunswick Amateur Radio Association. The highest-scoring contestant will be given an engraved cup, the New Brunswick Amateur Radio Association Trophy, and will have permanent possession of same.

Rules: 1) The contest will begin at 8:00 P.M. AST, Saturday, Jan. 28th and end at 8:00 P.M. AST Sunday, Jan. 29th. 2) Any and all amateur bands may be used. Phone-to-c.w., phone, c.w. and cross-band contacts are permitted. 3) The same station may be counted but once for credit, regardless of band worked. Mobile, portable and home stations covered by the same station license constitute the same station. 4) The general call will be CQ VE1. 5) Exchange signal report, county and province and operator's name. Local QTH is not required. 6) Logs should show band, signal reports, county, province, time and date. 7) Score one point for information received and one for information sent. Multiply total points by the number of individual counties worked in the three provinces concerned, to determine final score. 8) All logs should be forwarded, not later than Feb. 15, 1956, to J. E. Everett, VE1AAY, Contest Committee Chairman, R.R. 6, Fredericton, N. B.

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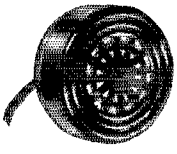
REG. $6 CRYSTAL MIKE



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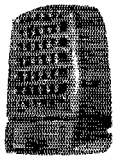

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70-7000 cps response. Moisture-sealed crystal. Gray metal case, aluminum diaphragm, shock-proof mounting, wind and blast proof; output level — 52 db. For hand, desk, or stand use — has standard 5/8"-27 thread adaptor. 6-ft. cord with strain relief. Ship. wt. ¾ lb.

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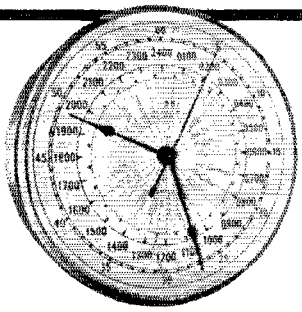

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RADIO SHACK CORP.

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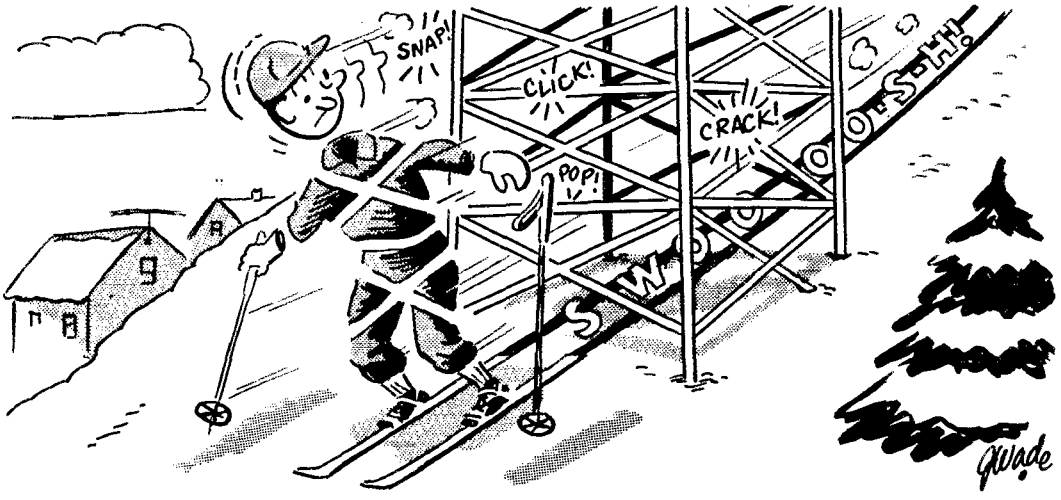
ONTARIO — SCM, G. Eric Farquhar, VE3IA — The Gateway Club of North-Bay voted its October meeting as one of the best this year. Mr. Tulloch, representing the Bell Telephone Company, showed excellent films, one telling the interesting story of the transistor and one on safety. Sincere condolences are extended to AIG, of Capreol, in the sudden passing of his mother. An ardent participant of many hamfests, her pleasant personality will be missed. CAU and DIH were seen at the recent v.h.f. hamfest in Syracuse. BJV and BQT conduct the code classes of the Nortown ARC. Newly-elected officials of this club are: DSG, pres.; BXF, vice-pres.; BJV, rec. secy.; HE, corr. secy.; DNK, treas. It's a girl! Congrats to BDH and his XYL. Classes for beginners and aspirants for Class A tickets are being held by the Ottawa ARC. This Club's recent auction, which was very successful, was the result of the untiring efforts of CMW, DY, BDH, and BXM. VZ, who heads this month's traffic totals, reports having worn out a second pair of 813s. BUR and his XYL spent a pleasant week end in N.Y.C. Colored slides on the history of the ARRL Headquarters station, W1AW, were enjoyed by the Quinte ARC. AVS has moved to a new location — next door! Visitors at the shack of CAB recently were AEW and AMT. RW has difficulty finding a suitable place to install the antenna mount on the new car. Traffic: VE3VZ 179, GI 96 DQX 70, KM 65, DSX 59, BUR 55, DPO 52, NO 49, TM 46, DH 22, PH 14, BZB 8, AUU 5, AVS 2.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — The gang at the Hull Club is planning a net on 220 Mc. for this winter. IZ was badly injured in a car accident. FL reports receiving conditions are very poor in the North Country with 75 meters almost useless in daylight. A portable rig in the form of a modified 19 set is now available for use of AREC members in the Siscoe mining area. CP participated in the CD Party and found that the new antenna made a big difference. DR reports good DX results on 21 Mc. during October. VE2YU, ex-VE6ZR, is active from Rosemere and is continuing his appointment as OO. II has entered the ranks of the benedicts. YK is a new ham at Richmond. VA, AUA, and AVZ maintain skeds thrice weekly between Three Rivers and Victoriaville. The seminary at Trois Rivieres has a gang of its own, consisting of EC, ADU, VA, AGI, and AUA. Traffic: VE2DR 71, CP 56, EC 39, FL 18, II 16.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — PAM: OD. RM: XG. WL reports that the 28-Mc. band is opening up and several of the Calgary gang are working this band. JP is active on 14 Mc. with fair results. PV reports that the Lethbridge gang is holding AREC practice sessions on Sunday mornings. NX has been working on a four-element beam for 20 meters. 144-Mc. rigs are sprouting around Edmonton with EA, WO, and MJ showing more than passive interest. PS is presently confined to the hospital and his XYL is checking in to the Alberta Net in Frank's absence. HM leads the Alberta gang in traffic-handling this month. YE holds "Swap and Shop" after the Alberta Net on Wed. evenings. Let George know what you have and what you want. In other words "Let George Do It." OD has the low-powered rig working well. JZ and TL are new-comers on the Alberta Net. Your response to requests for more reports is very much appreciated, gang. Keep them coming. Traffic: VE6HM 121, NX 42, YE 31, AL 20, OD 14, MJ 4, WL 3.

BRITISH COLUMBIA — SCM, Peter M. McIntyre, VE7JT — VE7ASR, RN7 manager, would like some c.w. stations in some of the larger places in British Columbia to check the net on 3575 kc. Mon. through Sat. from 1945–2030 or 2130–2215 hours. Glad 7CQ is still with us. He tangled with 1500 volts — it hurt but that's all. He is a real hot-shot now. BG is building a new QTH around a new transmitter and PN still is looking for a matched pair of 304TLs. Any around? The boys up north have a Northern Net on 3780 kc. starting at 1930 hours and would appreciate your coöperation as many of them have very low power and communication is sometimes necessary and if the frequency is QRMed it makes it kind of tough. The Dawson Creek gang has a very good paper out every three weeks called *Grid Leak*. The AREC and mobile gang in Vancouver set up communications during the floods in the North Shore and some operated continuously from 12 to 16 hours and the only failure was a dead battery. The new president and secy.-treas. of the BCARA are BQ and AV, respectively. A lot of the boys are prowling the DX portions of the higher frequencies as the elusive countries poke their heads through the QRM. Traffic: VE7AUF 32, QC 28, XY 18, DH 15, AIO 9, FS 8, AC 4.

MANITOBA — SCM, John Polmark, VE4HL — PAM: GE. OO: RB. OBS: KG. EQ has his new rig working and it sounds nice. PE is having c.w. mobile trouble in her little car. LO has quit farming for the winter and is working in Winnipeg. Congratulations to the Dauphin Radio Amateur Club on being one hundred per cent ARRL. The Manitoba AREC Net will meet weekly at 1900 CST Sun. in lieu of the regular nightly net. Emergency communications and message-handling will be emphasized. All net members are asked to participate. Traffic: VE4KL 33, GE 27, QD 20, YR 14, AI 10, XP 7, ER 6, KG 6, AY 3, PA 3, GB 2, RB 2, RR 2, RC 1.



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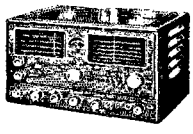

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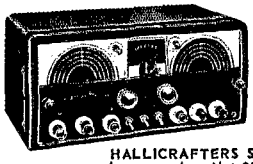

HALLICRAFTERS SX-100
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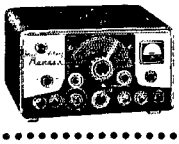

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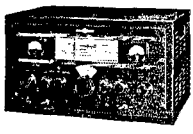

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S.S.B. Exciter

(Continued from page 31)

and secondary of T_1 for maximum signal at either grid of V_8. Replace V_9 in its socket.

Next set C_{43}, the bandset capacitor, so that the VFO covers the range from 3.345 to 3.545 Mc. This may readily be done by comparing the oscillator frequency with a frequency standard on the station receiver. The output of V_8 will be 455 kc. higher in frequency, and will therefore cover the 4-Mc. phone band. Actual dial calibration is in terms of the output frequency. The 3.8-, 3.9-, and 4.0-Mc. points should be marked on the dial in pencil pending final calibration.

Set C_{16} to the middle of its range. With the v.t.v.m. on the 6AG7 grid, retune primary and secondary of T_1. Set the VFO to 4.0 Mc. and tune the secondary (top) of T_2 for maximum signal. Turn the audio gain to minimum and tune C_{16} for minimum signal. This balances out the VFO signal at the 6AG7 grid. Turn the audio gain back up, set the VFO to 3.8 Mc., and tune the primary (bottom) of T_2 for maximum signal.

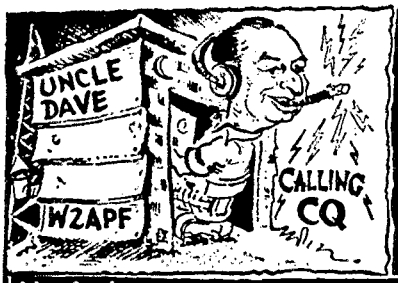
A 47-ohm 2-watt composition dummy load resistor should be connected across the output terminals. Connect the v.t.v.m. (or the "plates-direct" terminals of the oscilloscope) to the output, set the VFO for 3.9 Mc., and adjust L_4 for maximum signal. Retune the primary and secondary of T_2 at 3.8 and 4.0 Mc., respectively.

Turn the bandswitch to 7 Mc. and connect the v.t.v.m. to the 6AG7 grid. Tune L_3, the crystal oscillator tank coil, for maximum signal. Tune the VFO until a signal is heard in the receiver at 7.25 Mc. If the crystal oscillates at exactly 11.15 Mc., the VFO will still indicate 3.9 Mc. Tune L_1, the converter plate tank coil, for maximum output. Set the VFO to the point that gave 4.0-Mc. output on the 4-Mc. band, and tune C_{22} for maximum output. The bandswitch should be left at 7 Mc. C_{22} compensates for capacitance change across the T_2 secondary when changing bands. Reset the VFO for 7.25-Mc. output. Move the v.t.v.m. to the output terminals, and retune L_1. Tune L_6 for maximum output.

Turn the bandswitch to 14 Mc., and connect the v.t.v.m. to the 6AG7 grid. Tune C_{27}, the crystal oscillator tank capacitor, for maximum signal. Tune the VFO until a signal is heard in the receiver at 14.25 Mc. Tune L_2 for maximum signal, then with the v.t.v.m. connected to the output terminals retune L_2, and tune L_8 for maximum output.

The various tuning adjustments except C_{16} may now be rechecked with the oscilloscope on plates direct, or the v.t.v.m., across the output terminals. C_{16} can only be adjusted with the v.t.v.m. on the 6AG7 grid. L_4, L_6, and L_8 may be slightly detuned, if necessary, to equalize the outputs at the edges of the bands. C_{46} should be set so that there is no change in the carrier frequency when changing from upper to lower sideband at 3.9 Mc. There will, however, be a slight shift in the carrier frequency toward the band edges.

(Continued on page 130)



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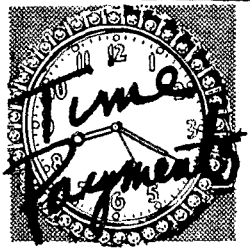

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Happenings

(*Continued from page 33*)

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of Amendment of Section 12.107 of Part 12, Rules Governing Amateur Radio Service, concerning radio teleprinter transmissions.	Docket No. 11501

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 6 of the Notice of Proposed Rule Making in Docket 11501, the American Radio Relay League, Inc. files these comments on behalf of the more than 48,000 U. S.-licensed amateur radio operators who are members of the League.

* * *

The League concurs in the proposal to amend Section 12.107(c) and 12.107(d) to remove the present lower limit of 800 cycles on the frequency shift used for amateur radio teleprinter transmissions.

The League believes that the best interests of all amateurs will be served by permitting a lesser frequency shift which will accomplish a reduction of interference. The League is also of the belief that the proposed amendment will permit more extensive experimentation with radio teleprinter communication, and will result in further improvement in and simplification of teleprinter techniques, and will thereby provide a more reliable means of communications.

In summary, the League is of the opinion that this rule making is in the interests of improved communication and that the Amateur Service will benefit by its adoption.

American Radio Relay League, Inc.
PAUL M. SEGAL
816 Connecticut Avenue
Washington, D. C.
Its General Counsel

A. L. BUDLONG
Its General Manager

Selective Converter

(*Continued from page 39*)

screws that hold the unit to the chassis. The panel shaft hole should be made large enough to clear the rotor shaft.

A National type O dial assembly was used to tune C_3, as this combination offers a good tuning ratio. One word of advice when drilling the holes for the dial assembly: the template furnished with the unit is in error on the 2-inch dimension (it is slightly short), so use a ruler to measure the hole spacing.

In wiring the unit, it is important that the

(*Continued on page 132*)

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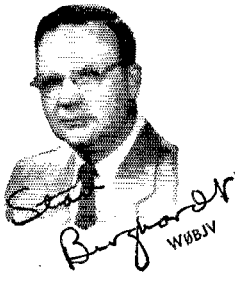

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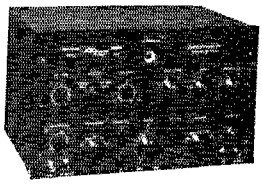

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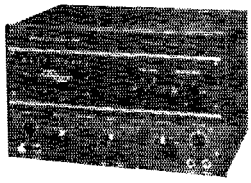

MODEL 10B—Successor to the popular Model 10A. 10 watts peak envelope power output SSB, AM, PM and CW. Multiband operation using plug-in coils. (Coils furnished for 1 band.) Choice of grey table model, gray or black wrinkle finish rack model.

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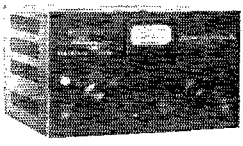

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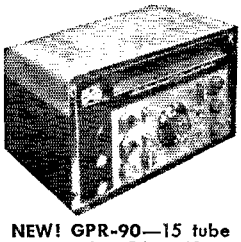

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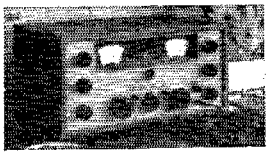

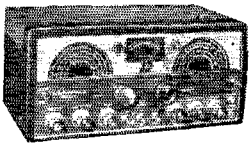

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output lead from the crystal socket be run in shielded wire. A phono jack is mounted on the back of the chassis, and a piece of shielded lead connects from the jack to the crystal socket terminal. The leads from the stators of C_1 and C_3 are insulated from the chassis by means of rubber grommets. Wiring of the unit is not critical; however, if this is your first construction job using a miniature tube, be careful that large balls of solder on the socket terminals do not short them to each other.

Testing and Adjustment

A length of shielded wire is used to connect the converter to the receiver: the inner conductor of the wire is connected to one antenna terminal; the shield is connected to the other terminal and grounded to the receiver chassis. The use of shielded wire helps to prevent pick-up of unwanted 1700-kc. signals. Turn on the converter and receiver and allow them to warm up. Tune the receiver to the 5.2-Mc. region and listen for the oscillator of the converter. The b.f.o. in the receiver should be turned on. Tune around until you hear the oscillator. Once you spot it, set C_3 at maximum capacitance and the receiver as close to 5.2 Mc. as you can. Adjust the oscillator trimmer capacitor, C_2, until you hear the oscillator signal. Put your receiving antenna on the converter, set the receiver to 1700 kc., and tune the input capacitor, C_1, to near maximum capacitance. At one point you'll hear the background noise come up. This is the 80-meter tuning. The point near minimum capacitance — where the noise is loudest — is the 40-meter tuning.

With the input tuning set to 80 meters, turn on your transmitter and tune in the signal. By spotting your crystal-controlled frequency you'll have one sure calibration point for the dial. By listening in the evening when the band is crowded you should be able to find the band edges for fair calibration points. For a nominal charge, your local radio serviceman will probably let you use his test oscillator to calibrate the dial roughly. If you have access to a signal generator, it is a simple matter to calibrate the dial.

You'll find by experimenting that there is one point at or near 1700 kc. on your receiver where the background noise is the loudest. Set the receiver to this point and adjust the slug on L_6 for maximum noise or signal. When you have the receiver tuned exactly to the frequency of the crystal in the converter, and we mean *exactly*, you'll find that you have quite a bit of selectivity. Tune in a c.w. signal and tune slowly through zero beat. You should notice that on one side of zero beat the signal is strong, and on the other side you won't hear the signal or it will be very weak (if it isn't, off-set the b.f.o. a bit). This is what is known as single-signal reception, and you've just been introduced to selectivity. The band's not so crowded after all, is it?

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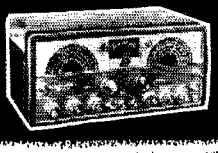

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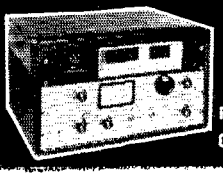

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!!! SEE PAGE 154

Conelrad

(Continued from page 86)

With the loose coupling shown between the coils in the photograph it is possible to separate all the local stations in the Hartford area (these range in frequency from around 800 to 1400 kc. and in power from 100 watts to 50 kilowatts), getting a distinct and usable meter reading from each. Normally, of course, the station with the longest program schedule would suffice.

Being battery-operated this gadget is useful as an emergency broadcast receiver in the event of power failure, and even when the single flashlight cell is "dead" it can still be used by switching over to the crystal detector alone. Homewound coils are used, not just because they cost practically nothing but mainly because they worked so much better than miniature slug-tuned b.c. coils that there was simply no comparison. The forms are sections of the cardboard tube on which paper towels are wound, the fixed form having a slot cut out to make its diameter less so the coils can be slid back and forth to vary the coupling. The selectivity has to be high enough to separate the b.c. station's normal operating frequency from both 640 and 1240 kc., if the station shifts to one or the other of those frequencies.

If you happen to be close to a local station, the transistor amplifier may not be needed. In West Hartford, for example, WTIC — a 50-kw. station about four miles away — operates the meter very nicely right off the 1N34A. Regardless of the power of the station and how close it is, though, you will find that a ground is an absolute necessity with a crystal receiver, and a fair amount of antenna is certainly desirable. However, with the transistor we are able to get adequate readings on all local stations with a 15-foot antenna in a residential location — plus a ground connection to water pipes.

While the various suggestions offered here will enable you to comply with the rules, they do not by any means constitute all the schemes that could be used. Neither are all of them applicable in all locations. Pick the one that best fits your case, or work up one of your own — and if it seems as though it might interest others, let us hear about it.

Strays

Here is another one for the "What's in a Call" department: W1SON, William J. Monahan, Norwell, Massachusetts, called CQ on 80 and K2GUY of Binghamton, New York, came pounding in. To further this odd coincidence, immediately following his QSO the next CQ brought in W3MJM, Jim Thorpe, Pennsylvania, whose call contains his initials! "Bill" was evidently looking for oddities that night.

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Lafayette brings you one of the finest high-fidelity turnover cartridges, AT AN UNBELIEVABLE PRICE! Frequency response from 40-14000 cycles +2 db. Has 2 sapphire styli to play all speeds. Needle pressure only 5 grams on LP cond 12-15 grams on 78. Output is .5 volts. Complete with turnover mechanism and knob, fits Webster, Garrad, VM, Collaro and tone arms of leading manufacturers of record changers and players.

2.75
Reg. Price ~~3.50~~

PK-79 ..... Singly, Each **2.75**
In lots of 3, Each **2.50**

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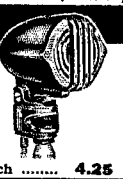

COMPARE IT WITH ANY MIKE AT 2 to 3 TIMES THE PRICE

A quality crystal Microphone for PA systems, house recorders, etc. Frequency response 30 to 10,000 cycles. Output level —52 db. Provides ample output for use with low gain amplifiers. Complete with 5 ft. of shielded cable. Shpg. wt., 3½ lbs.

PA-24— in lots of 3, each ... **3.95** singly, each **4.25**

SLIM HIGH OUTPUT DYNAMIC MICROPHONE

NEW!

Reg. Price ~~41.50~~ Net **9.95**

A pencil-slim design, high output PA Dynamic Microphone of exceptional quality, at a price that is ⅓ of the price of any comparable microphone on the market today. Very smooth response, 50-11,000 cycles. Omnidirectional, tiltable head. Switch on side gives choice of either high impedance (50,000 ohms) or low impedance (250 ohms). Instantly removable bracket permits use either on stand or as hand mike. Features exceptional mechanical strength. Cast case with satin chrome finish, ⅝"-27 thread, Acoustically-treated grille head, 8" long; 1¼" barrel diameter. Shipping weight 2 lbs.

PA-29.....In lots of 3, Each **9.25**
Singly, Each **9.95**

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FOR RECORDING TELEPHONE CONVERSATIONS

Induction telephone pickup. Telephone conversations can now be picked up with no tapping of wires or special telephone circuits. Simply place the phone base, either cradle or upright type, on the pick-up platform and connect the leads to the high impedance input of any medium gain audio amplifier, or directly to any tape disc or wire recorder.

MS-16..... **2.95**

A NEW LIGHT WEIGHT DYNAMIC EARPHONE

Fits right into the ear. Ideal for use with radio sets, for private listening. DC resistance 2000 ohm impedance 5000 ohm with 3 ft of Plastic Cord.

MS-72 ..... Net **1.95**

MS-100—Impedance 8 ohm for silent radio or TV viewing. Net **1.95**

MS-260 — FOR TRANSISTOR CIRCUITS, Special high out put for low power circuits; DC resistance 2000 ohm, impedance 8000 ohm. Net **3.95**

TRANSISTOR 455 KC I.F.

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MS-126—
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Single, Each ..... **89¢**

RAYTHEON TRANSISTOR CK722 P-N-P 99c

TRANSISTOR LOOP ANTENNA

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Fixed inductance tapped to match 600 ohm input. Covers 540-1650 kc with 365 mmf variable cond. size 9/16 x 4⅛".

MS-166 Net **1.25**

TRANSISTOR TYPE 2N107 P-N-P $1.25

TRANSISTOR OSCILLATOR COIL

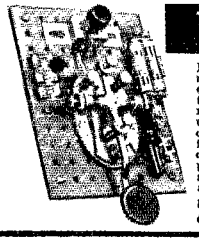
Supplies local OSC. energy to mixer stage, IF 455 KC. Use with 365 mmf cond. ⅝" x 1⅛" high.

MS-165 .....Net **49¢**

New Price!

4.65

RAYTHEON TRANSISTOR CK-760 (2N112)



TRANSISTOR CODE PRACTICE OSCILLATOR KIT

For those interested in mastering the international code, an audio tone oscillator is essential. The circuit of this transistorized feedback oscillator has the simplicity of the neon glow, the signal strength of the vacuum tube, and requires only two penlite cells for weeks of service. It may be used for solo practice, or two may send and receive with the same unit. Kit comes complete with Transistor, Telegraph Key, Resistors, Condensers, Masonite Board, etc., and Schematic Diagram.

KT-72 ..... Net **2.99**

Cannon ECI—Single Headset ..... Net **1.13**

Three-Band Vertical

(Continued from page 43)

are unshorted on L_1 and C_3 so they will be in series with L_2, while C_1 is changed to a different setting. For 75 meters, C_3 is shorted out, L_3 is unshorted and connected in series with L_2, and the tap on L_1 changed to 4 turns down. C_2 is then

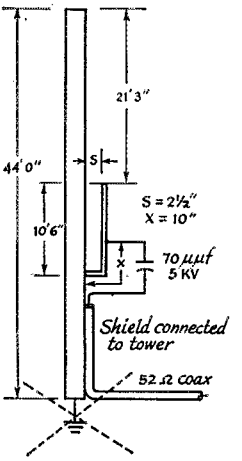
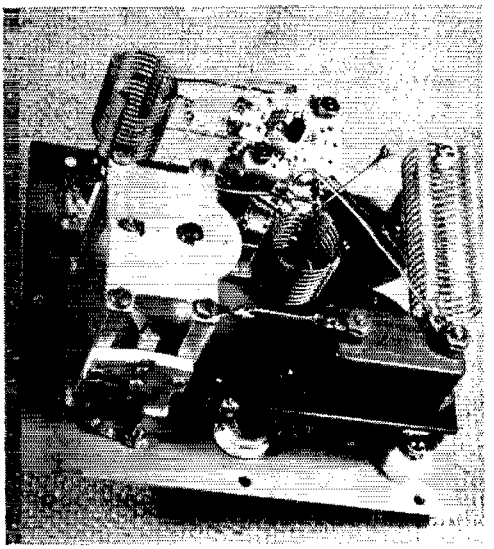


Fig. 2 — Feed arrangement for using the top half-wave at 21 Mc. The base of the antenna is grounded through a clip-lead on this band.

connected across C_1, and C_1 is adjusted to resonance. When you change bands, just turn the switch and peak up the antenna current with the variable capacitor, C_1.

The power-handling capacity of this tuner is limited by the current handling ability of the Miniductor coils and the voltage and current ratings of the capacitors. With 250 watts into the antenna, I have had no breakdown of components

(Continued on page 138)



Inside view of the matching circuit. The r.f.-type mica condenser at the upper left is C_2. C_3 is just below it. The coils, made from commercial stock, are L_3, L_2 and L_1, from left to right.

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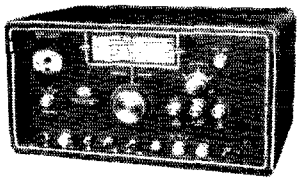
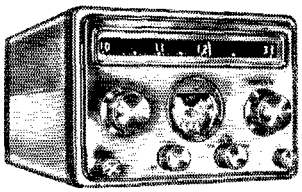


New! Barker & Williamson 5100-B Xmtr

80, 40, 20, 15, 11, 10 meters fone & CW. Self contained power supply which also can be used for SSB xmtr 51SB-B. Separate excitation control. 64 to 1 gear driven dial gives 1 Kc. divisions on 10 meters. Amateur net: **$475.00**

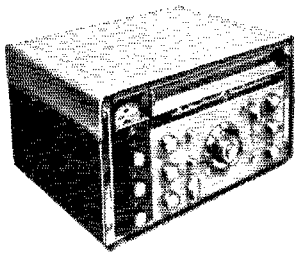


New! Gonset G-66 Mobile Receiver

AM • CW • SSB

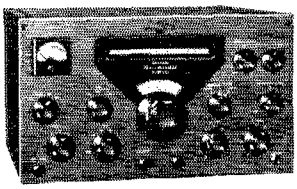
Bdcst., 160, 80, 40, 20, 15, 10 meters. Use with 6 or 12V systems or with 115V for home station. Amateur net: **$169.50**

Matching 3-way power supply with built-in speaker. Amateur net: **$39.95**



New! NC-300 "Dream Receiver"

Specifically designed to include all the features most hams want! Amateur net: **$369.95**



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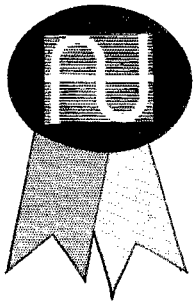
W6QJI	**W6YPA**	**W6LTY**
W6KSF	**W6VCR**	**KN6JJM**
K6DPH	**W6LD**	**W6VBY**

some prices slightly higher west of the Rockies



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from overloading during the past year or so of operation. I did have trouble from water getting into the match box during sprinkling operations until I built a waterproof doghouse. So bear that in mind, as the tuner won't work when flooded out! I had a bakelite shaft through the switch wafers, and the first time the tuner got wet inside, the bakelite swelled and split the ceramic wafers in half. The bakelite shaft is a good idea from the insulation standpoint, but if it is used make sure the fit isn't too tight and allow for swelling during damp weather.

The 44-foot vertical was found to be unsatisfactory on bands other than 20, 40, and 75/80 meters, because of low radiation resistance in the case of 160 meters and too high a radiation angle on 15 and 10 meters. However, I added the feature shown in Fig. 2, which is a modified "bazooka" outrigger up on the tower, for exciting the top part of the antenna as a half-wave radiator, for 15 meters. This is also what is known as a shunt-excited "J" stub antenna. When operating 15 meters the coax is disconnected from the match box and connected to the coax that runs up the tower to the bazooka section. The tower base should be grounded by jumpering the antenna and ground terminals on the match box.

DX Contest

(*Continued from page 53*)

per band which may be earned by W (K) stations *in the c.w. section* is 18, and contacts made on the same band with the same country after the quota is filled will not count. Thus complete exchanges with 6 stations in one country on one band fill the band quota for that country. The maximum number of points per country per band which may be earned by VE/VO stations *in the c.w. section* is 24, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with 8 stations in one country on one band are thus permitted Canadian participants. There is *no quota* for stations in the c.w. section *outside* of the U. S. and Canada. There is *no quota* for *any* station in the phone section.

11) *Reporting:* Contest work must be reported as shown in the sample form. Each entry must include the signed statement as shown in that example. Contest reports must be mailed no later than April 30, 1956, to be eligible for *QST* listing and awards. All DX Contest reports become the property of the American Radio Relay League. No contest reports can be returned.

12) *Awards:* To document the performance of participants in the 22nd ARRL International DX Competition, a full report will be carried in *QST*. In addition, special recognition will be made as follows:

a) A certificate will be awarded to the high-scoring single-operator phone and to the high-scoring single-operator c.w. entrant in each country (as shown in the ARRL Countries List) and in each of the 73 U. S. and Canadian ARRL sections (see page 6 of this issue) from which valid entries are received. In addition, a certificate will be awarded to the high-scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

b) A suitable certificate will be awarded to the operator making the highest single-operator phone score in each ARRL-affiliated club, provided the club secretary submits a listing of a minimum of three phone entries by bona fide resident members of such club, and provided further that these scores are confirmed by receipt at ARRL headquarters of the individual contest logs from such members. The highest single-operator c.w. scorer in each club will be awarded a certificate under the same conditions.

c) ARRL will award a gavel to the affiliated club submitting the greatest aggregate phone and c.w. score by bona fide resident club members, whether single- or mul-

(*Continued on page 140*)

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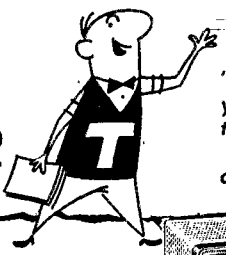

MR. "T" Says:

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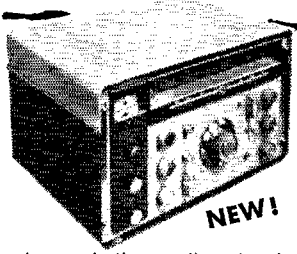

National NC-300 "Dream" Receiver

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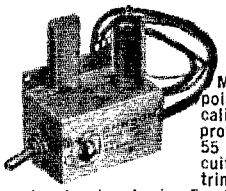
Finished in two-tone gray enamel. Complete with tubes. Net **$369.95**



NEW! JOHNSON 100 KC CRYSTAL CALIBRATOR

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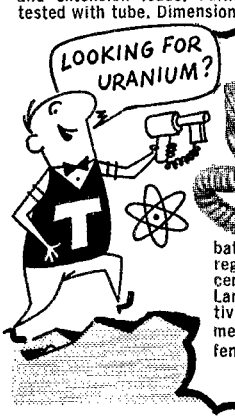

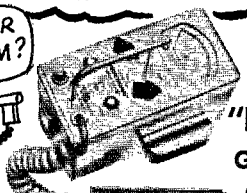

PRI Model 107C "PROFESSIONAL" GEIGER COUNTER

Greatest accuracy, most stable performer, longest battery life of any portable Geiger Counter made, regardless of price! Features EXCLUSIVE PRI Percent Meter, which estimates value of ore in field • Large view meter • coiled probe cable • 4 sensitivity ranges, 2 time constants. Also the best instrument for low level area surveys required in Civil Defense work. **With Leather Carrying Case $149.50**

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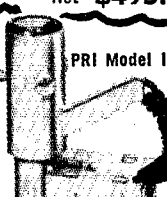

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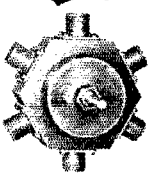

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tiple-operator entries, provided such scores are confirmed by receipt at ARRL headquarters of the individual contest logs from such members.

13) *Judges:* All entries will be passed upon by the ARRL Award Committee, whose decisions will be final. The Committee will void or adjust entries as its interpretation of these rules may require.

14) *Disqualifications:* Each participant agrees to observe the contest rules as well as all regulations established for amateur radio in his country. Some examples of grounds for disqualification are: off-frequency operation as confirmed by a single FCC citation or advisory notice or two ARRL accredited Official Observer measurements; low tone reports in logs; working countries on the "banned list[1]" — footnote information applies to U. S. A. amateurs only.

[1] As we go to press, prefixes to be avoided are FI8-3W8, PK, EP-EQ, HL.

How's DX?

(Continued from page 59)

prefixes ranged from XU to AC1 2 3 8 and 9 and the melodious rhythms of XU2UU's c.w. rolled out of Shanghai. . . . Guam used the prefix OM. . . . Friend Prescott in Panama signed RX1AA. . . . Saar was TS instead of 9S4. . . . The French really had us hopping — Tahiti was F9 and Algeria FM8, for instance. . . . Rhodesia had the prefix string VP1 through VP9." ._ ._ ._ In late October Worcester, Mass., was invaded by 49 staunch New England DXCC members, an annual affair. W1MUN reports the gala evening enjoyed by all and says Boston will be the battleground for NEDXCC's 1956 set-to . . . ._ After a pair of annums in Germany and a spell as DJ2JA, W5VNC returns to the Oklahoma end of 20 meters ._ ._ ._ Any skywire K2DSW puts up still leaves him with an inferiority complex — neighboring b.c. towers of WOR soar skyward some 250 feet. Now how about a rotary (or plain groundplane!) atop one of *those* sticks? ._ ._ ._ W9RKP offers his services as a headquarters for an outbound QSLs co-op wherein subscribers will join forces to reduce postage on bulk shipments to foreign bureaus. Within inherent limitations (see p. 66, May '55 *QST*) such an idea could be fruitful. Write W9RKP for details ._ ._ ._ W9s ABA AIO ALI AMU DPI DSO EU EWC FDX FID FJY FKC FNR GDI GNU GRV HP HUZ IU JIP JJF KXK LI LNM MXX NDA NN PCF QIY QLH RBI RKP TKV UIG UJ UM UQT UXO VND WFS and YFV checked in at last October's annual W9DXCC meet in the Windy City. A ball for all — even rumors that AC5PN was breaking through on the long path failed to tear the visitors away from their turkey ._ ._ ._ Next month K2CJN takes another of his periodic business jaunts to the West Indies where he'll visit on-the-air ham pals from CM1/CO all the way to VP3 ._ ._ ._ Ohio Valley ARA's *Ether Waves* reports VP2LH freshly ticketed in the Leewards, while VP5BM leaves his Turks assignment in favor of Windwards VP2ing ._ ._ ._ YL W1MCW forsakes her DXCC Honor Roll score for a new location in Fort Lauderdale, Fla. ._ ._ ._ *Say* — next month is *it*, gang. Time for the 22nd ARRL International DX Competition, that is. Not much preparation time left, you know. Got your major lobes all sharpened up?

YL News & Views

(Continued from page 65)

a day, regardless of what else comes up.

Perhaps many of us could use a twenty-minute plan for our amateur activities too. We're not referring to those YLs who regularly put in many hours a day or week, but to that too large group who goes along hoping to find time for a QSO or bit of building or studying, but who get to it too infrequently. Of course, there is nothing to stop you from spending more than twenty minutes, but we must start somewhere, and since the plan has worked so well for so many already, let's start with the twenty minutes. Incidentally, you will be amazed at

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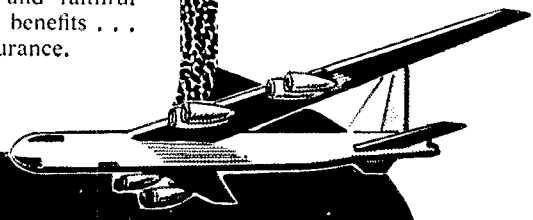

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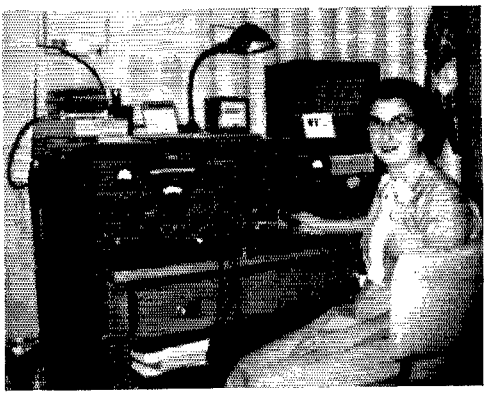

Code practice station WØLGG, Bertha Willets, of Marshalltown, Iowa, alternates practice schedules with WØEGQ — 3695 kc. Monday through Sunday, 1800 CST; 5–13 w.p.m. — see November, 1955 *QST*, Operating News. Bertha, an ORS appointee, has a 30 w.p.m. code proficiency award.

what you *can* do in such a short time, too. Twenty minutes a day times 365 days (366 for 1956) means 7300 minutes or 121⅔ hours per year per YL. What an impact we could make during the coming year!

Net News

W9GME is NCS of a new ten meter phone net which meets Tuesday at 1300 EST on 29,000 kc.

The NYLON (Northwest YL Operators' Net) meets Wednesday at 0900 PST on 3820 kc. W7QYN is Manager and members alternate as NCS.

W9RUJ replaces W6UHA as NCS for the YLRL twenty meter phone net (Thursday, 1100 PST, 14,240 kc.). W7IDO is the new alternate NCS.

W4HLF is NCS of the YLRL 75 meter phone net which meets Tuesday at 0800 EST on 3900 kc.

Custodian of the YL Century Certificate Katherine M. Johnson, W4SGD, (Box 666, Fuquay Springs, North Carolina) sends the following memo to all interested in the YLCC:

"Gold stickers will be awarded to applicants who have worked their additional contacts from the same location (or within a 25-mile radius). Silver stickers will be awarded to those who have moved away from the location in which they earned their original certificate. This new ruling is effective as of October 19, 1955. Also, please remember that when applying for a certificate or endorsement sticker, the full names of the operators, alphabetically arranged, and the dates and times of each of the contacts *must* be included."

Keeping Up With the Girls

In October, sixteen YLs in the Washington, D. C. area met and formed a YL amateur radio club. All YLs in the vicinity are invited to membership. Contact W3MSU, Ethel. Two club nets were scheduled: Wednesday at 2130 EST on 7100 kc. and Thursday at 2000 EST on 3900 kc. . . . The North Star YL Club (Minnesota), organized in

(*Continued on page 148*)

Hudson

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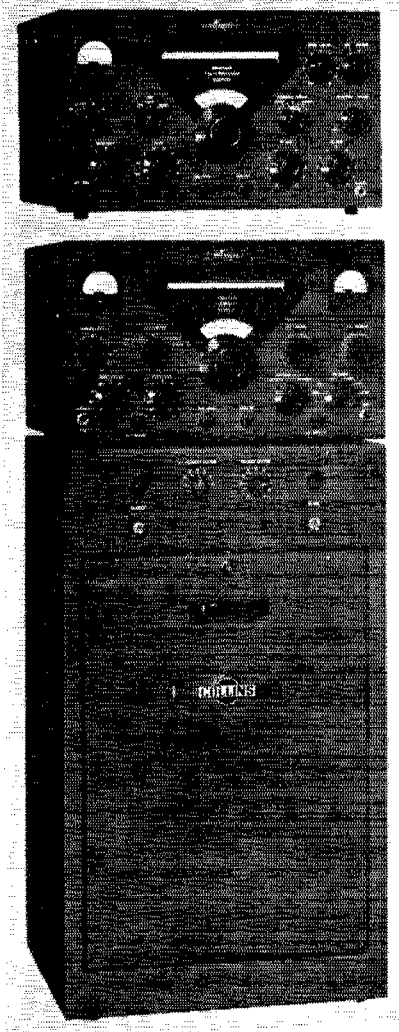

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The 75A-4

Designed to operate on seven HF bands—160, 80, 40, 20, 15, 11, and 10 meters—the 75A-4 assures best SSB reception, as well as conventional CW and AM. AVC is used on SSB and CW, with separate detectors for AM and SSB signals. There is pass band and rejection tuning, and the 75A-4 offers a crystal calibrator that is an integral part of the circuit. **75A-4 Receiver,** complete **$595.00**

TEAMED with the 75A-4 Receiver is the Collins KWS-1 Transmitter, top in its class, with minimum low order mixer crossover products and spurious outputs. It has VFO operation from 3.5 to 30 mc, and there's a dial calibration of 1 kc per division.

The KWS-1

It utilizes single conversion on the 80 meter band, with dual conversion on all higher bands. Extremely stable oscillator circuits afford maximum overall stability in the KWS-1. Unwanted sidebands are rejected more than 50 db, while the audio passband is limited to 3000 cps. More than 60 db reduction of the carrier is possible, and distortion is kept 35 db down.

KWS-1 Transmitter, complete **$1,995.00**

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World Above

(*Continued from page 64*)

bands. More or less out-of-the-hat, we picked 50.1 and 144.6 Mc. as starters, but asked for suggestions.

Quite a bit of mail has been received on the general subject, and we've had many discussions over the air and in various radio club meetings we've attended around the country. Everyone seems in favor; the question is, what channels?

The subject was argued at some length at a recent impromptu 6-meter hamfest at the home of W3OJU, Washington, D. C. Nobody liked 50.1 Mc. Too likely to be loaded when the band is open. Thousands of 8350-kc. crystals at large. Operators who do not know about the arrangement will use 50.1 at random. Calling frequency should be in a RACES segment, preferably not too far from the low end, so that antennas peaked for the popular part of the band will still work on the calling channel. Should not be too high, for the same reason, and also to avoid trouble with Channel 2.

A spot that seemed to fit all these requirements is 50.55 Mc. It is a readily-available surplus-crystal frequency (8425 kc.), yet it is not too far up in the band. This also follows reasoning advanced in correspondence we've received on the subject. So, unless someone can talk us out of this one — and you'll have to be very persuasive — the National Calling Frequency in the 6-meter band is 50.55 Mc.

Getting into a RACES segment seemed advisable for the 2-meter band also, and several correspondents have pointed out that the channel should be one that is open to Novices. As with the 6-meter band, it should not be too high up in the band, but it should be out of the kilowatt alley at the low edge. We've had as many suggestions as we have correspondents, but a channel that seems to make the most sense is 145.35 Mc. That multiplies from 8075 kc., if you use crystals in the 8-Mc. range, as most of us do.

So, assuming we now have calling frequencies, how and when do we use them? And when do we *not* use them, which is just as important?

When to: For calling while working mobile, in an area where there is low or no observed activity. For monitoring and calling (Auto-call systems) in areas of high activity, when a contact is needed quickly. By isolated stations, when the band is open — but only to attract attention.

When not to: General QSOs, any time, anywhere. Contests. Calling or operation of nets. (This will call for some coöperation, as just about any surplus-crystal frequency you pick will find somebody's net using that channel.)

In other words, these channels are for establishing contact. When you get answers, you shift off. How far? Seems to us we could spare 20 kc. either side, to make sure that everyone can hear anything that comes up on the calling channel. How many of you will now guarantee to use 50.55 and 145.35 Mc. in this way, and in this way only?

OES Notes

W1HDQ, Canton, Conn. — Ionospheric-scatter skeds being kept each Saturday and Sunday with W4HHK, Collierville, Tenn. Five-minute transmissions are made on 50.005 kc. at 0830, 0840 and 0850 both days, with other times to be tried at later dates. Would welcome one-way or two-way tests with interested parties who have high-powered rigs, large antennas and good receiving facilities. Also keeping tropospheric-scatter skeds with W3OJU, Washington, D. C., Mondays, Wednesdays and Fridays at 2245, two-minute transmissions each way, and with W2UTH, Victor, N. Y., Saturdays at 0800. All transmissions c.w.

W3UQJ, York, Penna. — Good results in "groundwave" coverage on 50 Mc. with Philadelphia and Washington, D. C. areas, operating nightly from 1800 on. Also keeping 220-Mc. skeds at 2130 Tuesdays with W3s UJG CGV YQD AJD and W4UMF. Halo antenna mounted on suction cups about 12 inches above car roof working out fine for 50-Mc. mobile. York Country 50-Mc. net, 10 stations, Mondays, 2030, 50.136 Mc.

W5FPB, Albuquerque, N. Mex. — Southwest Regional Conference of CAP showed several wings going in for v.h.f.; Louisiana Wing covering entire state, direct or via relays.

W6NSJ, Albuquerque, N. Mex. — Working on 432 Mc.

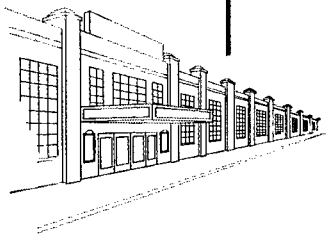
(*Continued on page 146*)

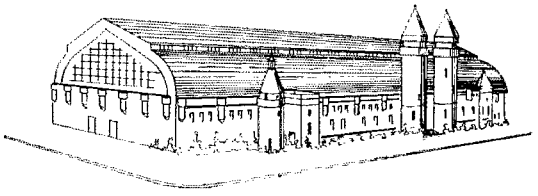
This year it's

KINGSBRIDGE 3

March 19-22
New York City

for the
Radio Engineering Show





For the third year in succession, the great annual IRE Radio Engineering Show will open its doors to the industry for four spectacular days at the Kingsbridge Armory and Kingsbridge Palace in New York City. As in the preceding years, the Show will be filled to capacity with 704 exhibits and displays of the latest and newest developments in radio-electronics.

Is it too big? Not as a true representative of this giant industry. More than 200 papers presented by 22 Professional Groups at the Convention's 55 technical sessions are an accurate index to new research and development... and the 704 exhibitors represent about 80% of the productive capacity of the industry ... not one whit larger than necessary to keep pace with electronic America today!

Plan now to attend the industry's most vitally important Show where

Over 42,000* meet!

*At the 1955 Show, 42,133 men and women from coast to coast and every field of radio-electronics attended the Radio Show. This year, attendance is expected to go even higher. Don't miss it!

Over 700 Exhibitors will show all that is NEW in radio-electronic engineering!

THE INSTITUTE OF RADIO ENGINEERS
1 East 79 Street, New York

each Tuesday at 2000 with W5FAG. Planning hop to 1215 Mc. with crystal control in transmitter and receiver.

W5SCX, Ardmore, Okla. — "Big Stick" operation by W5UND, Dallas, on high Channel 8 TV array boosted his Communicator signal to level usually achieved with medium-power stations on large arrays at average levels.

W7YJE, Seattle, Wash. — With W7DYD caught surprise 50-Mc. opening to W6-land Oct. 23rd. Several 50-Mc. oldtimers back in business; W7DYD showing the way with 8-element array atop 80-foot tower. Royal Order of Hoot-Owls (midnight net on 6) now has 16 participants.

M8EVH, Columbus, Ohio — Six-meter operators in the Columbus area are looking for contacts nightly at 2200, beams northeast and northwest, and southeast and southwest at 2215. Net organizing for operation on 51.5 Mc.

W9KLD, Kankakee, Ill. — Occasional Channel 2 TVI troubles on 144 Mc. (image response in receivers with 45-Mc. i.f. systems) cleared up easily with traps in antenna leads.

W9KQK, Elmhurst, Ill. — Checking earth currents as indication of auroral conditions.

W9MHP, Indianapolis, Ind. — Local and extended-local activity on 6 picking up. Better coverage expected with new 5-over-5 array.

WØMOX, Overland Park, Kan. — Correlation of barometric pressure and extended-range signal levels for four months shows evidence far from being conclusive, but whenever the barometric reading was over 30.1, signals from outside the normal range were well above average. Many weak carriers of voice signals heard under these conditions, emphasizing need for more use of c.w. in 2-meter work.

KH6ZD, Honolulu, T. H. — Completing W2PAT radio-teletype converter (January, 1953, *QST*), for RTTY work on 2 with KH6AED. KH6LD to join group on receipt of machines.

Novice Round-up

(Continued from page 50)

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this *QST*.

2) *Time:* All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) *QSOs:* Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80-, 40-, 15-, or 2-meter bands. Crossband contacts are not permitted. C.w. to phone, c.w. to c.w., phone to phone, phone to c.w. contacts are permitted. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) *Scoring:* Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this *QST*) worked during the contest is the "section multiplier." A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Round-up report a copy of qualifying run from W6OWP, January 7th or February 3rd, or from W1AW, January 17th or February 15th. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Round-up reports become the property of ARRL and must be postmarked not later than March 14, 1956.

6) *Awards:* A certificate award will be given to the highest-scoring Novice in each ARRL section.

7) *Disqualifications:* Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. ARRL Contest Committee decisions are final.

(*Continued from page 142*)

August with fourteen members, meets on the second Tuesday of each month at homes of the members. Officers are President WØMSW; Vice President WØQVQ; Treasurer KNØBJZ; Secretary WØQXF and Assistant Secretary WØQXA. . . . W4BWR, Ruth, is EC for South Brevard County, Florida. . . . W6QMO, Jeri, is the first woman radio operator at A6USA, MARS, Presidio of San Francisco, since the WACS operated the station during the war. . . . During the August floods in the Northeast, W3YTM set up her Ranger at Red Cross headquarters in Honesdale, Penna., and with the help of her OM, W3RRI, Mildred,

"A very dependable operator of the Burlington County Radio Club station K2KED" is how K2BG, SCM of the South New Jersey section describes Juliette High, W2EBW. Julie operates 40 and 20 c.w. and 10 and 2 phone from her home QTH at Moorestown. Her OM is W2EVR.

moved a lot of emergency traffic on c.w. . . . KZ5s DG, KA, LM, PL, and VR find 15 meters well worth their time. . . . W3WUE, Adelaide, is Assistant Manager of the Pennsylvania Interstate Phone net. . . . While visiting in Chile, W3UKJ, Mena, worked home to Philadelphia from CE3JJ in Santiago and from CE2HD in Vina del Mar. . . . K6DLL, Marcia, can be contacted through KA2TR in Japan. . . . W6NAZ, Lenore, chose a three-element beam on a 60-foot tower in place of a vacation. . . . YLs who attended the Northern Alabama Hamfest were K4APF, W4s CMK, RLG, TOG, VDL, WJX and W5AVD. . . . W7s HHH, ZLS and ZLT have been helping the Central Oregon Radio Amateurs convert a Quonset hut into a clubhouse for members. . . . W7ENU, Mary, wired a Heathscope for use in her OM's TV shop, and W8RIR, Beth, assembled a capacitor checker kit. . . . For submitting a prize-winning essay on the advantages of a college education, W6WSV, Carol, won a $1500 scholarship for her seven-year-old daughter in a contest conducted by a Los Angeles department store. . . . W7BKJ, Dolly, is secretary of the Idaho Falls R. C. . . . W7PNF, Katherine, is doing graduate work at the Pacific School of Religion, an interdenominational seminary. . . . W4s UDQ, WTJ, TIE, and UDI participated in the SET, on October 9th. . . . YLs who are regular members of the Minnesota State Net (c.w.) are WØs IRJ, KJZ, QXA and QVF — Tenth Regional Net (c.w.) — WØs IRJ, KJZ, LGG and KQD — Central Area Net — W9JUJ, WØs KJZ and KQD. . . . KN2MZD, Clara Marie, is a thirteen-year-old YL from Brooklyn, and WN8RGD, Candy, is a twelve-year-older from Princeton, West Virginia. . . . W7KEU, Laura, has been in Ortonville, Minnesota, for the past two years on an "extended visit." . . . Florence, ex-KL7AZJ now K4BUN, of Alexandria, Virginia, is working for the government as a geologist. . . . W4s HMJ, Florence, and WTJ, Betty, appeared on a local TV program to promote ham radio. . . . W7NH, Nell, is NCS on PAN one night each week and alternate two nights. . . . W7QKU, Donna, is an NCS of the newly-organized Northwest Traffic Net. . . . W5SYL, Iva, is Communications Officer of the Grand Prairie Squadron of the Civil Air Patrol. . . . Newcomers to the Texas YL Round-Up Net are K5AOO, Dorothy, W5DIV, Ann, and W5LVT, Jimmy. . . . YLs who attended the Washington Area Club hamfest at Gaithersburg, Maryland, were W3s AKB, CDQ, CZT, DLH, MSU, OLY, RXD, SLS, TSC and W4s DEE, ETR, and TVT. . . . K6HWB, Vivian, and her OM K6ARY are home from the hospital following an accident in which their car, mobile rig and pet dog were demolished. . . . Thirteen-year-old K6CQT, Ann, has been appointed Official Observer. . . . After years of QSOs on ten meters, W3NNS and W5IZL met in person for the first time when Ruth flew from Texas to vacation with Anabel. . . . "Portland Roses" is the name selected by members of the new Portland, Oregon, YL club. . . . Congratulations are in order for several YLs, all of whom have given birth to sons recently: W1WNT, Evelyn, August 12th; W1YYM, Ellen, Assistant Communications Manager Phone Headquarters, November 8th; K6HVC, Marge, October 15th; W7SFS, Vera, September 8th; W7ZKY, Dee, September 9th, and W8UFZ (ex-W2RTZ), Hope, September 23rd.

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W2NM, Dr. Walter V. Girvin, Ashville, N. Y.
W3TAP, William E. Leister, Kittanning, Pa.
W3UU, Edward M. Thompson, Steelton, Pa.
W5ABH, Talbot A. Williams, Bay City, Texas
W5CEK, William R. Kenyon, Corpus Christi, Texas
W5TTU, Patricia M. Parks, Rotan, Texas
W6OPM, Cal D. Smith, Los Angeles, Cal.
W6UGB, Charles L. LeBlanc, Redwood City, Cal.
W7GAE, Charles M. Weagant, Portland, Ore.
W8LCG, Meredith C. Merrill, Detroit, Mich.
W9DTB, Ralph L. Puckett, Elmhurst, Ill.
G3CXD, Reginald Bowers, Newcastle, England
KL7PB, Joseph M. Frydlo, Cordova, Alaska
OH3QR, Reino Lampinen, Lahti, Finland
VE1EM, E. M. Johnston, Dartmouth, Nova Scotia
VE2ASW, D. Walter Stockwell, Villa St. Laurent, Quebec, Canada

HAMFEST CALENDAR

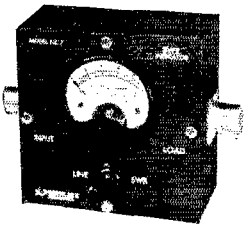
Illinois — Society Radio Operators, Chicago Amateur Radio Club will hold their Annual Dance and Cabaret Party Saturday evening, January 14, 1956 at Albany Park Masonic Temple, 4860 No. Kedzie Ave., Chicago, Illinois. Regular and square dancing, and refreshments will round out a swell evening for everyone. Festivities start at 8:30 p.m. Tickets $1.50 from Club members or at the door.

Strays

E. Ellen (W1YYM) and Bob (W1WPO) White, both of ARRL's Communications Department, announce the arrival of James Arlen White on November 8, 1955. Very likely their scheds for CN-CPN and working DX in the early hours now can be met without an alarm clock. Congrats!

SWR METER

Model NE-7



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★ Measures standing wave ratio in any co-axial feed antenna system.

★ Each meter individually calibrated with chart.

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★ SO-239 type connectors.

Specify whether for 52 ohm or 73 ohm cables

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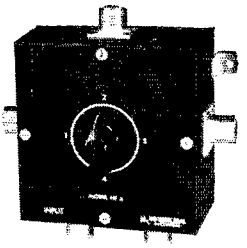
Amateur Net **$7.50** Wired and Tested



★ Four position rotary switch for co-axial cables.

★ Low SWR 1.75 to 30 Mc. 5 Amps of RF in any fixed position.

★ 1000 volt insulation (will handle a K.W. with nominal SWR).

★ Five SO-239 type connectors.

Use this switch for switching to any four antennas or three antennas and dummy load

If Not Yet at Your Distributor's Write W9MRW at:

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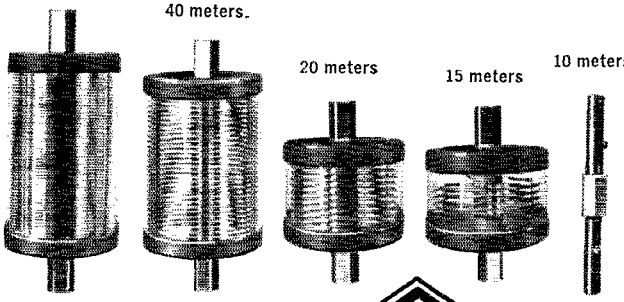

Our laboratory tests show these coils have a "Q" over 400. 1 coil per band (80, 40, 20, 15) plus 10 meter shunting bar designed by Vaaro-Davis. Choose your band with maximum efficiency. No pruning necessary. Coils peaked at factory. Color coded, lets passing hams know what band you're on. Mount coils in seconds with Vaaro-Davis Kwik-On Connectors.

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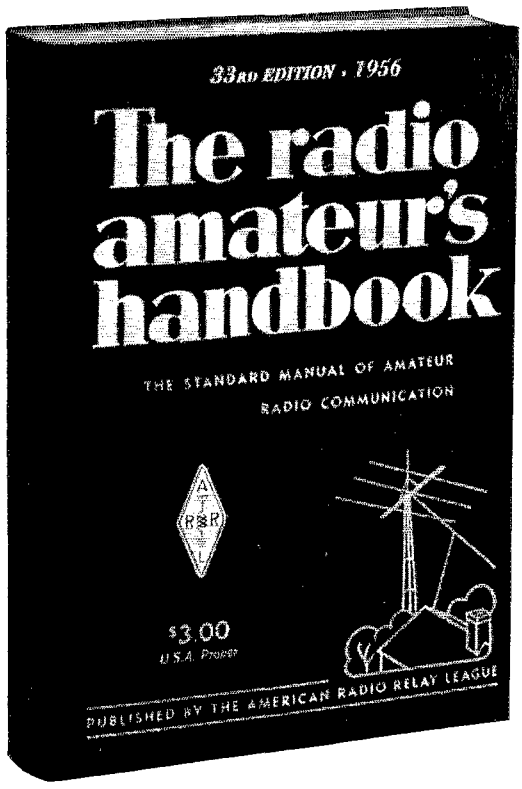

RECOGNIZED as one of the most valuable and widely used books in electronics, the Handbook is universally consulted by both amateur and professional alike. The more than 700 pages in this new edition have been revised and modified in the light of current application and technique. The Handbook is found on the desks of executives, engineers, technicians and purchasing agents of the radio industry as often as in the shacks of radio amateurs throughout the world. As a text alone it is widely used in radio schools, colleges and the Armed Forces. Twenty-seven chapters plus a catalog section featuring electronic components and equipment of leading manufacturers and suppliers. Contains one of the most complete listings of vacuum tube and semiconductor data in existence.

$3 USA proper **$3.50 US Possessions and Canada** **$4 Elsewhere**
Buckram Bound Edition $5 Everywhere

The AMERICAN RADIO RELAY LEAGUE, Inc.
WEST HARTFORD 7, CONN.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state **whether you are a member of ARRL.**

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

WANTED: Early wireless gear, books, magazines and catalogs (before 1922). Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $4.00. Mrs. Earl Mead, Huntley, Montana.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

MICHIGAN HAMS! Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. NOrmandy 8-8696. NOrmandy 8-8262.

WANTED: All types aircraft & ground transmitters, receivers, ART-13, RT18/ARC1, R5/ARN7, BC610E, BC221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

PANORAMIC Adapter AN/APA-10 Tech. Manuals $2.75 postpaid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y.

DX-O-GRAPH. The DX man,s guide for band conditions. Know when, where, and what band. Foremost DXers use it. $2.50. Request flyer. Box 4596, Winston-Salem, N. C.

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NEW ICA deluxe Signatone Code Oscillator (Reg. $15.75): Special, $7.95. Key, $1.35 extra. Surplus RG-8/U cable, 100 ft., $5.95, 250 ft., $13.25, 500 ft., $25.00. Free Bargain Bulletin. Visit store for unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Pa.

OUTSTANDING ham list revised monthly. Our prices on trade-ins are realistic and down to earth. We feature Johnson, National, Collins, Hallicrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics and all leaders. We trade easy and offer time payments tailored for you. All leading brands of equipment in stock. Write today for latest bulletin and a copy of our new catalog just released. Stan Burghardt, WØBJV, Burghardt Radio Supply, Inc., Box 746, Watertown, So. Dak.

MULTI-BAND Antenna, 80–40–20–10, $18.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Ky.

UFO Patrol data. W5CA.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, alternator, regulator & rectifier, $60.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmermann Jr., K2PAT, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

U. S. A. DX QSL Co-op. Free information write: Bill Tagan, WØDVN. P. O. Box 5938, Kansas City 11, Mo.

SSB! Sell or trade 75 meter SSB exciter. Less than 50 bux. Write for full details. Will answer all queries. W4WQT, Wilson, Rte. 5, Clarksville, Tenn.

WANTED: QST March and May 1916 $25.00 each or will swap any eight 1917 or 1919 issues for each. Have 1935 to 1954 complete. Four issues or more at 25¢ each. WØMCX, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

QSLS? SWLS? Finest and largest variety samples, 25¢ (refunded). Callbooks (Winter), $4.00. Subscriptions to radio publications. "Rus" Sakkers, W8DED, P. O. Box 218, Holland, Mich.

QSLS-SWLS. Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS-SWLS. 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS. Nice designs. Samples. Beseparis, WJQCC, 207 S. Balliet St., Frackville, Pa.

QSL Specialists. Distinctive. Samples free. DRJ Studios, 1811 No. Lowell Ave., Chicago 39, Ill.

DELUXE QSLS — Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSLS-SWLS. Samples free. Bartinoski, W1YHD, Williamstown, N. J.

QSLS of distinction! Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

QSLS. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS. Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

WOODY's (Formerly Rosedale Press QSLS). Box 164, Asher Sta., Little Rock, Ark.

QSLS. Taprint, Union, Miss.

QSLS. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSLS, SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLS-SWLS. Samples free. Cy Jones, W3EHA, 840 Terrace, North Hagerstown, Md.

QSLS Multicolor, all kinds, all prices. Samples dime. Fast service. DX Cards, Kulik St., Clifton, N. J.

QSLS. Beautiful blue, silver and gold. 100: $3.85. 24 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS, SWLS. Samples free. Backus, 5318 Walker Ave., Richmond, Va.

QSLS: Comic, rural, Doctors!! Samples 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS, SWLS. 2-colors, 125 $2.00. Samples 10¢. Bob Garra, 414 Mahoning St., Lehighton, Penna.

QSLS. Attractive, samples free. W3EHA. Jones, 840 Terrace North, Hagerstown, Md.

QSLS-SWLS: Cartoons, colors, others. Reasonable. Samples 10¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLS. Cartoons, photos. Samples free. Press, R. Harmon, 5019B Gramar, Wichita, Kans.

QSLS. Fluorescent, Rainbow, cartoons. All types. Samples 10¢. Catalog, 25¢. World Printing, 166 Barkley Avenue, Clifton, N. J.

QSLS. Samples 10¢. Write for information on specials for clubs and individuals. Graphic Crafts, Route 12, Ft. Wayne, Ind.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

VERTICAL antenna: 20-40-80M. $59.50 to $89.50. Information on request. El Cajon Electronic Engineering Enterprises, Building 4, Gillespie Field, Santee, Calif.

FLORIDA Bound? Stop at Tamishaw Motel, a Ham's Haven. North Trail, Ft. Myers, Fla. "Eb" Long, K4GEW.

CASH for BC-610E, BC-614E, BC-939, BC-729, BC-221, BC-312, 348, TCS, AN/GRC-9 and higher, and parts for all these. Amber Industrial Corporation, Surplus Div., 75 Varick Street, N. Y. C. 13, N. Y.

SALES Representative wanted by distributor of nationally known industrial communication systems and mobile-radio equipment to cover states of Pennsylvania, Delaware, Virginia, W. Virginia, Maryland and D. C. Send résumés to P. O. Box 1709, Wilmington, Del.

FOR Sale: SX-71: $135; 32VI, $325. Both are in excellent condition. C. B. Story, W7TGZ, 540 Wyoming Ave., Sheridan, Wyoming.

COLLINS KW-1, in excellent condition, $2500 F.o.b. location. National HRO-60, $325.00. Electrosonic Devices, Inc., 642 Grant St., Pittsburgh 19, Penna.

MERRY XMAS and a Happy New Year from WØCVU. On the air since 1913. Equipped with Collins KWS-1 and 75A-4.

THIS is it! The Ham-Pal ten-meter ground plane. None better! Weighs two pounds and will withstand anything. Money back guarantee. $29.95 prepaid. Sawyer's Radio, W1ZAO, North Bellingham, Mass.

FOR Sale: 1625 tubes modified for grounded grid. R.F. tested, $1.50 each; 4 for $5.00 plus postage. 7 prong sockets, 19¢ each. Delaware Electronics, 205 West 4th St., Wilmington, Del.

VALUE: Central Electronics slicer and plug-in IF, never used, plus Two 805s for ½ KW on sideband. $80 value for $45. Joseph, W9AOI, 354 Osage, Park Forest, Ill.

FOR Sale: BC610E, very gud condx: $250. Albert Young, WØWOV, Rte. 1, North Platte, Nebr.

FOR Sale: Carter 6 volt Dynamotor, 600 volt at 170 Ma., $25; four Elmac 250T tubes, used, $4.50 each. W7CMO.

QSTS 1928 to date. Best offer. A. Lukach, 35 East 84th St., New York City.

COLLINS 310-C2 with 160-80-40 meter output, $125.00; pair 2 meter communicators, $150.00 each; Johnson Matchbox, $40.00; Model B slicer, $80.00; G-E VRS-1 sideband slicer, $50.00; SP44 Panadapter, $60.00; Bandmaster Senior with VFO and AC power supply, $110.00; Viking Ranger $200.00; Collins 32V-1 late series, spare, 4D32, $400.00. Ralph Farano, 308 N. Locust, Spokane 62, Washington.

SELL: Viking II and VFO, factory-wired; NC98 and Electro-Voice 630 with stand. Best offer above $359.00 takes all. Need money for college. All F.o.b. Clinton, Mississippi. W5ZBC/5, Edwin Shell, Mississippi College, Box 441, Clinton, Miss.

SELL: 829B tubes, slightly used, guaranteed, $6.00 each. Dick Rice, W9LOC, 1503 South Anderson, Urbana, Ill.

SELL: Lysco 600 in gud condx: $50.00. Moran, 90 Barrister Rd., Levittown, L. I., N. Y.

NOVICES! $13.50 buys a complete CW xmitter kit, 3 bands, 5 watts input. Operates on 115 VAC or DC. Price includes all parts: key, crystal, prewound coil for one band, simple instructions and postage. Nothing else to buy. Wonderful results reported. Ray Industries, 10 Courtland Rd., Camp Hill, Penna.

CLEANING Shack! Have equipment for AM, SSB, Power supplies, rotator, Hi-Fi, air conditioner, books, magazines, test equipment for TV-Radio repair, few TVs and radio-phono. Consider trades. Stamp for list. W4API, 1420 South Randolph, Arlington 4, Va.

FOR Sale: Freq. meter BC221Q. Cardwell, comp. $60.00; Ant. tuner 7/14 Mc., $35.00. A. P. Schlachter, W3KNQ, 7724 Kelly St., Pittsburgh 21, Penna.

SELL: Harvey-Wells TBS50D complete with many extras. Best offer. Local deal preferred. Samkofsky, 264 Division Ave., Brooklyn, N. Y.

K4EKH: New QTH. Harold W. Bales, 58th Weather Recon Sqd. APO 937 c/o P. M., Seattle, Wash.

LINK, control heads, cabling, instruction books wanted. Cash or trade. Higley, 82 Lower Main St., Matawan, N. J.

SALE: Heathkit VF-1 and AT-1. Neatly built by experienced ham. $15 and $25.00. Hal Greenlee, Box 96, Case Institute, Cleveland, Ohio.

FOR Sale: SX28 with built-in xtal cal. mod. monitor, clipper stage that works, excellent to cut out QRN. $100.00. F.o.b. Pomona, N. J. Wm. Grunow, Jr., K2HPX.

FOR Sale: best offer by piece or by lot: Globe Champion transmitter, less modulators, with VFO, complete with coils; National NC-57; BC-342 receiver; Merit V.T.V.M.; Eico V.T.V.M., Bud 100/1000 Kc frequency standard; Eico 5" 'scope. Contact W5TYN, Bane, 124 Autumn Drive, Vicksburg, Miss.

HQ-140X with spkr and Bud 100 Kc osc., $185; Viking II with break-in; D-104 mike and stand; VFO Johnson Matchbox and SSR, $260; less than year old, used very little. Need funds for new home. G. Case, 3818 Pleasant, Des Moines, Iowa.

RACK Cabinet, 66" Parmetal, new condx, $35.00; National MB-40SL tank, $13.50; spare 4-125A (Eimac), used only 2 hours, $12.50; used 829-B, $2.50 ea.; used 826, $1.00 each. F.o.b. San Lorenzo, Calif. K6EYB, 760 Via Marin.

TR75TV, excellent condx, one set coils. Worked 3000 miles on 80 meters, $3950. Ship express collect. W1ARG, 95 W. Emerson St., Melrose 76, Mass.

DB22A, $39.00; Millen 90881 with coils 10 thru 80, $69.00; Thordarson 21M64, $29.00; Thordarson 20D83, $12.00; Stancor C-1415, $19.00; 2 new 812s, $3.00 ea.; 4 new 5514s, $3.00 ea.; 3 used OK 829s, $9.00 ea. W3BRS, Campbell, Taneytown, Md.

COMPLETE Station: practically unused. Viking II and VFO, factory-wired plus Baluns and R.F. ammeter and Vibroplex. recvr; HQ140-X purchased October 1955, both for $500. Payments if necessary. G. B. Bird, 238 Rutgers Pl., Nutley, N. J.

WANTED: National S40B. Send lowest price and full details to Michael Muntner, 104-21 68 Drive, Forest Hills 75, N. Y.

WANTED: NC-108 FM recvr. State condx. Dr. L. G. Barrett, 26 So. Main, Hanover, N. H.

FROSTBITERS! Will trade new approved Rohde-built Penguin complete with Joys Orion sail for 75A4 or price of same. W9FTP, 644 169th, Hammond, Ind.

FOR Sale or trade: Pair of "Traps" to convert your "doublet" to an all-band antenna. 107 ft. flat top required with no taps or tuning for 80 thru 10. $6.00 per pair postpaid is equal to cost of parts if purchased for single pair. All inquiries answered. J. Max Pemberton, W9VJH, Ex-W4BOA, 812 N. 9th St., Matoon, Ill.

SELL: Harvey-Wells TBS50C, $80; Select-O-Ject, $8.00. Orv. Mitchell, VE3BA, Brantford, Ont. P., Can.

SALE! Complete 120-watt phone, 150-watt CW station, 80, 40, 20 and 10: $95.00. BC348R recvr, $75.00. Other gear. W8AIU, 1595 Maywood Rd., Cleveland 21, Ohio. Telephone EV-1-2433.

WANTED: HRO 50T1 coil unit AA covering 27 to 30 Mc. Sell: HF-152A, never used, $40.00. F.o.b. Seattle, Wash. William D Reuter, W7KT, Burton, Washington.

FOR Sale or trade: Highest quality 16 dual speed (33 and 78) portable recorder and playback. Handles up to 17" transcriptions. The Presto 1D cutting head flat 50 to 8000 cpc. It's a Model V. Consists of 75A recorder and playback in its own case and an 87A amp. with spkr and V.U. meter. This is a Presto professional recorder. Cost net price $771.00. It's in A-1 shape. Make an offer. Want transmitter, e.g. Collins, Barker & Williamson, Hallicrafters, any excellent. Don Clark, W7OHG, 18 W. Pacific St., Blackfoot, Idaho.

VIKING I with Heathkit VFO, $155, without VFO, $140 F.o.b. Bay area. K2HID/6, 68 Bret Harte Terrace, San Francisco, Calif.

HEATHKIT AT-1 transmitter and AC-1 coupler, in excellent condx: $35.00. Les Reitz, WØWEA, Watertown, Minn.

WANTED: ART-13 and ARC-3 equipment. Let me know what you have and the price. B. Spivey, 3117 Rolling Rd., Chevy Chase, Md.

FOR Sale: Millen #90881 power amplifier, with 829B tube, 2 and 10 meter coils, $30; Millen #90800 exciter, $20.00; Rack mounted SCR 522 transmitter with G-E meter, $23.00; matching power supply, $10.00; T-23/ARC5 2 meter xmitter, unmodified, less 832A, $15.00; broadcast band ARC5 receiver, $10.00; T-19/ARC5 3-4mc, $12; new Eldico model MT-2 2 meter mobile xmitter, $25; Millen R9'er with 10 and 20 meter coils, $13.00; all inquiries answered. Art Johnson, K2POA, 29 Boone St., Bethpage, L. I., N. Y.

MOTOR Generator, Electric Specialty Co., 110 volt AC, 400 volt ¼ ampere. Best offer. Lukach, 55 East 84th St., New York City.

WANTED: Viking Mobile, $65 plus shipping. W9BQR.

FOR Sale: RCA Voltohmyst Jr. V.T.V.M. in gud condx, $17.00; CQ run: 1947, Oct., Nov., Dec.; 1950 June, July; 1952, Mar., Apr., June; 1954 Mar., Dec.; 1955 July, Aug.; Radio Craft & Radio Electronics: 1948, Mar., May, June, July, August, Sept., Oct., Dec.; 1949, Jan., Feb., March, Apr., June, Aug., Oct., Nov., Dec.; 1950, Feb. thru Dec.; 1951, 1952, 1953, all twelve issues for those years; Radio News-Radio & Television News: 1954 June; 1947, June, July, Aug., Dec.; 1948, Jan.; 1953, Mar., Apr., May; 1954 all twelve issues. All magazines in gud condx. 20 cents per copy. Cecil G. Baumgartner. Box 343, Milton, Penna.

MARINE Receiver 15 Kcs. to 650 Kcs. Mfgd Federal Tel. Co. for U. S. Coast Guard, 110 v. AC 110 v. dc or batteries. In good used condx. $25.00 plus freight. Seibold, Garrison, Md.

SSB: C.E. 10A exciter, factory-wired with BC458 VFO (C.E. conversion), QT1, and coils for three bands: $150.00. Will ship express collect. J. H. Wainwright, W4IEH, 941 Country Club Circle, Ft. Lauderdale, Fla.

FOR Sale: National NC-88 receiver, in perfect condx, in original carton, $95.00 postpaid. Also 100 Kc. RCA freq. standard, $5.00. W5DZL, 2284 Hillsdale, Baton Rouge, La.

SALE: Viking II, Antenna Coupler and VFO, new, factory-wired. Will not ship. $275.00. W2BXO, Theodore A. Bedell, 403 Berg Ave., East Meadow, L. I., N. Y.

WANTED: Surplus UTC plate transformer, D-4050, National Co., L-912-1, 1500-v ct., 325 Ma., round body, sealed. W5GH, 2229 S. Ewing, Dallas, Texas.

SWAP: Nilson's 60 lesson radio 15 lesson television course, valued $50.00, for radio gear. Also CREI complete television course valued $100.00 for radio gear. Nolan, 3425 Wesley, Berwyn, Ill.

BARGAINS: With new guarantee: S-38D, $39.50; S-40A or S-77, $69.00; S-47C, $59.00; HFS w/power supply, $99.00; Lysco 600, $79.00; S-27, $79.00; S-76, $149.00; SX-71, $159.00; SX-42, $159.00; HRO-50T1, $299.00; Collins 75A3, $395.00; Sonar VFX 680, $29.50; Eldico TR75TV, $35.00; Heath AT-1, $24.50; Meck T60, $39.50; HT-17, $29.95; EX Shifter, $39.50; Glove Scout 40A, $69.50; Globe Trotter, $49.50; HT18, $69.00; Harvey Wells Sr., $69.00; Elmac A-54H, $89.00; PSA-500, $27.50; Viking I, $159.00; Viking II, $229.00; SS-75, $139.00; Globe King 275, $249.00; Globe King 400A, $295.00; 32V1, $325.00; 32V2, $395.00; and many others. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

WILL Trade NC173 and speaker and 1750-1500 volt 300 Mc. power supply for a later model receiver. W1HOU, Cushing, 43 Ashland St., Manchester, N. H.

FOR Sale: Motorola FMTRU(A) 30D mobile xmitter/recvr units on 150 Mc., $35.00; Motorola FMTR-30D-26-40 Mc. mobile xmitter/recvr units @ $45.00. Ralph Villers, Box One, Steubenville, Ohio.

SWAP: Mobile ham station. A54H dynamic mike xmittr, two power supplies, PA-500 matching A.C. for fixed station, Eicor dynamotor for car. Gonset Super Six converter, noise limiter, Web Band spanner antenna, Master Mobile Mount, mike relays, cable, etc. 50 watts in car or home. Like new. Will trade for 75A1, A2 or A3, give or take, or sell for $225 cash. W4CYM, P. O. Box 2163, Orlando, Fla.

KEEP your QSLs filed for quick reference in our Hammerloid Steel File, size 11" by 6½, by 5" with alphabetical index. Will initial call letters if desired. State call. Send $5.50. We pay shipping. G. Kaminski, 2814 Albion St., Toledo 6, Ohio.

RUBBER Stamp: Call, name and address, $1.00, includes inking pad. Richard's, 2029T Bradley, Chicago 18, Ill.

FOR Sale: Viking Ranger, HQ-140-X, D-104, 42' vertical: $400. Robert Glaser, WØVGA, Mulvane, Kansas.

SELL: Factory-wired Globe Scout, original owner: $90. Knight VFO, $20; Vibroplex "Champion," $10; 50 ft. RG8/U, $3; 15-meter dipole, $2.00. W8TWA, 618 S. Cochran, Charlotte, Mich.

DELUXE Chart "Amateur Bands at a Glance." All the amateur bands illustrated. Band limits. Privileges, emissions. Send 50¢ to Amband Company, P. O. Box 632, Boston 2, Mass.

FOR Sale: Power transformers, one each of 2500VCT, 400 Ma., $12; 1300VCT 250 Ma., $6.00; 800 VCT, 250 Ma., $5.00; 10V CT, 10 amp., $2.00; 6.3V CT, 5 amp., $2.00. Unused tubes (2) 803s, $5.00 each; (2) 811s, $2.00; (2) 902s, $2.00. W4ESD, 29 Morton St., Aiken, S. C.

2-METER beams: 6 element, horizontal or vertical, all seamless aluminum. $6.95 prepaid. Whole Supply Co., Lunenberg, Mass.

WANTED: ARC1, ART-13 transmitter. Write to W4VHG, Box 5878, Bethesda, Md.

SSB Exciter, Central Electronics 10A, VFO, 20 and 75-M coils, $110.00. W2CFT, Box 483, Lake Ronkonkoma, L. I., N. Y.

FOR Sale: National NC-88, new condx, $80. Brian L. Bartlett, 105 Tyler St., West Haven, Conn.

250 WATT phone/cw xmitter. 813, mod. 809s. VFO, $95.00. TA-12D, $25.00. Tommy Bass, 503 Edward Gary, San Marcos, Texas.

BUY Heathkit, Johnson, Viking, Tecraft and other equipment wired and tested direct. New Heath DX-100 transmitter wired and tested, $241.50. Free list of reconditioned equipment, trades accepted. J. Lynch Electronic Co., P. O. Box 54, Glen Oaks Branch, Floral Park, N. Y.

TRADE or sell: RME-69 and DB-22 on S-76 and TBS-50C. James Devlin, West Mountain, Ridgefield, Conn.

SALE: Mobile Gonset Super-Six with noise-limiter, $40.00; Elmac A54-H with A. C. power supply, $130. PE-101C Dynamotor, $5.00. Frank Segalla, W2FFH, 316 Jerusalem Rd., Scotch Plains, N. J.

FOR Sale or trade: T-17 microphone, $3.00; TG-10 Code Keyer, $13; 12-Station Intercom Master, $15; pair of telephones, $5.00; portable radio, $5.00; Johnson Speed-X Key, $1.50. All excellent, priced F.O.B. V. R. Hein, 418 Gregory, Rockford, Ill.

NEW ENGLAND Hams: Phone or write Olde Rex first when in the market for new or used mobile installations, fixed station gear, communicators, test equipment, Telrex beam antenna custom installations, tower erections, Wincharger Portable generators and Hi-Fi components. Largest stock of used gear in Massachusetts. Open evenings, week-ends and by appointment for personal service and consultation. Novice problems and lashups our specialty. Shack located 5 Retrop Rd., East Natick, Mass. Phone OLympic 3-2130. Olde Rex's Trading Co., Wellesley Hills 82, Mass. "Walt," W1WGM.

GLOBE Scout, 65 bandswitching fone/cw xmitter for sale. Like new condx. Perfect electrical physical and mechanical condx. No trades. First $80.00. Will express 500 miles. Dean Leander, X-WN9ILF, Cambridge, Ill.

CENTRAL A slicer, $59.95; AP-1, $6.95; QT-1, $9.95; 10A, $99.95; Gonset 10-11, $24.95; 3001, $5.95; 3008, $29.95; 3011, $24.95; 3028, $29.95; 3030, $39.95; 3041, $89.95; Triband, $29.95; Babcock MT-5A, $69.95; MT-5B, $89.95; Harvey-Wells APS-50, $29.95; VFO, $37.50; TBS-50A, $69.95; TBS-50C, $69.95; TBS-50D, $79.95; Johnson VFO, $44.95; Mobile, $99.95; Viking I, $169.95; I-TVI, $249.95; I-push-to-talk, $199.95; II, $265.00; Mobile VFO, $34.95; Lysco 50, $7.95; 401, $9.95; 403, $29.95; 500, $79.95; 600, $99.95; 600-S, $129.95; 650, $69.95; A-129, A-175, A-180 each, $9.95; Collins 32V1, $395.00; 32V2, $450.00; 32V3, $550.00; Meissner EX, $44.95. Complete list used items available including Hi-Fi. Evans Radio, Concord, N. H.

SX-71, absolutely new condx, original carton. Used only 40 hours: $157.50. Also SX-24, clean, perfect: $75.00. Going VHF. W1KO.

OSCILLOSCOPE, 3" Triumph, $20.00; New, with manual BC-906 frequency meter, 13-26 Mc., $20.00; 10 control boxes, 10 x 6 x 4 each containing 8 switches, 2 potentiometers, 12v DPDT relay, 5 resistors, 2 knobs, $2.00 each. Shock-mounted chassis, 5 x 6, 50¢ each. Aluminum mounting plates 3 x 5, 15¢ each; mobile antenna, easily converted to 144 or 220 Mc., $1.00 each; Simpson, model 127-0-5 made meter, cost $8.00, $3.00 each. Centralab 823AZ trimmers, 12-62 μfd, new, Erie N500 4-30 μfd, new, cost $1.50. Sells at 50¢ each. Will swap any of above articles. Gerard Moor, W1OGY, 53 Garland Ave., Cranston 10, R. I.

SELL: 75A-2 with NBFM, xtal calibrator, spkr, $295.00; 32V-2 converted to 32V-3, $450; 75A-1, $225. All in tiptop condition. Might consider trade high grade trap gun. WØMWD.

LEAVING Ham Radio: Collins 75A1 recently factory realigned, with mechanical filter, crystal calibrator, speaker, perfect in appearance and electrically, $275.00; Pandadaptor, perfect shape, $59.00; Johnson Viking II factory wired with Viking VFO, Bud low-pass, Matchbox, all like new condx, only eight operating hours: $259.00; Gonset Super Six and noise limiter, new, $40.00; Morrow 3BR with noise limiter good, $24.00; miscellaneous equipment. Larry Hess, W8GTT, 2576 Edgerton, Cleveland 18, Ohio.

LEECE-Neville 6 volt system 100 amp. job. Complete with voltage regulator and rectifier, excellent, $45.00; PE103, $20.00. Morrow Triband, like new, $30.00. S. Lieberman, 130-29 228th St., Laurelton, L. I., N. Y. Phone La 7-1642.

WANTED: ART-13, ARC-3, ARN-6, ARN-7 test sets, other military surplus. Advise price, condx. We pay freight and C.O.D. James S. Spivey, Inc., 4908 Hampden Lane, Bethesda, Md.

NATIONAL NC-57B with "S" meter accessory. In gud condx: $50. K2DIL, 1845 Greenport Rd., Far Rockaway 91, N. Y.

TREMENDOUS bargains: New and reconditioned Collins, Hallicrafters, National, Johnson, Elmac, all others. Completely reconditioned with new guarantee. Hallicrafters S38, $29.00; S40B, $79.00; S76, $99.00; SX71, $139.00; SX62, $159.00; SX42, $169.00; SX96, $199.00; SX88, $395.00; HQ129X, $159.00; HQ140X, $199.00; National NC125, $129.00; NC173, $149.00; NC183, $179.00; HRO50T, $239.00; NC183D, $269.00; HRO50T1; HRO60; Collins 75A1, $249.00; 75A2, $299.00; 75A3, $399.00; 32V1; 32V2; 32V3; Viking Ranger, Viking II; large stock of mobile receivers, transmitters, converters, hundreds of other items. Easy terms. Shipped on trial. Write for free list. Henry Radio, Butler, Missouri.

WANTED: RT18/ARC1, ART13, BC788C, R5/ARN7, BC342 and other communications or test gear. Top prices paid. Air Ground Electronics Co., 1515 W. Fillmore, Phoenix, Ariz.

MULTIBAND Antennas; work all bands the quick low-cost way. The "Six-Bander", 6 through 80, only $3.25. Open wire folded dipoles, $4.95 up. Many other models. Write for free literature. R. J. Buchan Co., Bricelyn, Minn.

SELL: BC610E; BC614E speech amp.; Meissner signal shifter, Model EX; ant. tuner, coils for 80, 40, 20, 10; TVI suppressed; $500, not sold separately. 32V2, $400; 800 watt, 110V, 60 cy. Kohler gas generator, $125.00. All the above in excellent condition. Lee Marks, W6MZO, 105 Inner Circle, Redwood City, Calif.

GONSET 2-meter communicator, 12 v., brand new, $175.00; Gonset VHF linear amp., brand new, $120.00; Black and Decker ¼" drill, $10.00; Vertical stand for drill, $5.00. Fred S. Eggert, 11833 Wisconsin, Detroit 4, Mich.

MEISSNER EX Shifter TVI suppressed, perfect condition, $45.00. W3TOL.

SELL: One VHF152A, 2, 6 and 10 m. converter, $60.00; one TRF 7-27 Mc recvr and dynamotor, $40.00. Both for $90.00. R. von Hall, 32-72 30th St., Long Island City 6, N. Y.

SELL: AT-1, AC-1 TVI suppressed BC454B recvr, heavy duty Dynamotor (filtered). All new, only $50.00 for the works. Samuel Marderness, WN3CVF, Mohrsville, Pa.

WANTED: Complete 12v. used all-band mobile rig. K4AKK, Guy Hollis, Scottsboro, Ala.

16" Hi-Fi electrical transcriptions. Catalog 25¢. Transcriptions, 166 Barkley Ave., Clifton, N. J.

HRO-7, four bandspread coils, power supply, speaker; HFS, 27-250 Mc. power supply; SCR522 with Dynamotor, unconverted; Lysco 600 with extra TVI suppression plus Lysco antenna coupler. Sell to best offer. W3NCF, 718 Carl, New Kensington, Penna.

FOR Sale: Collins 32V-3, $500; 75A-2 with calibrator and speaker, $300.00, both perfect. Herb Hollister, WØDRD, 709 Baseline, Boulder, Colo.

COLLINS 32V2 transmitter in top condition. $375 shipped prepaid in USA. Robert Wolfe, W3HDT, 2506 E. Hoffman St., Baltimore 13, Md.

SELL: SX42 and speaker. First m.o. of $130 takes it. PE-103, make offer. Used BC-459, $3.50. D. L. Robinson, 1609 Westview Dr., New Kensington, Pa.

COMPLETE Model 12 teletype machine, sync motor keyboard polar relay, reperforator, tape head, $170 or best offer. Will deliver personally within 250 miles. 15 amp powerstat, $25.00; 1470 V.C.T. 1.2 amp xfrmr, $28.00; BC-223 complete, $40; relay rack, $15.00; pair heavy duty selsyns, $20.00. Stan Fierston, W1BRJ, 224 Eastern Ave., Lynn, Mass.

VIKING Ranger, newest model, wired and tested only. Not used on air, perfect condition, $225 prepaid in USA. Davis, W8LOL, 119 W. Stanton, Worthington, Ohio.

WANT: ARC-1, ARN-7, ART-13, DV-17, CU-25, APR-4, APR-9, TDQ, BC-610-E, BC-614-E, BC-939-A, BC-342, BC-312, BC-348, BC-221, TS-173, 32V, 75A, ARC-3, Teletype, Boehme, Technical Manuals, Test Equipment, APN-9A, Cash or trade for NEW Johnson Viking, Ranger, National NC-300, Hammarlund HQ-140X, Pro 310, Hallicrafters SX-100, Barker Williamson 5100 Transmitter, Gonset, Elmac, Morrow, Harvey Wells, Central Electronics, Telrex, Fisher Hi-Fi. Write or phone: Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048. Tom, W1AFN, Stores: 44 Canal, Boston. 60 Spring, Newport, R. I.

WANTED: Pointer coupons from Olson-Akron, Ohio. Cash or trade electronic or ham gear, any quantity. W4WT, Eubank, 1227 Windsor Ave., Richmond 27, Va.

SELL: Electro-Voice audio clipper, $12.50; Millen Variarm VFO modified for 20A, $20; Millen R9er, $15; typewriter swap or sell, $45; Millen exciter, $20; window neon sign, replaceable letters, wonderful and very rare, $50; Hallicrafters S36 receiver, $95; Brush tape recorder, BK401, $75; Link police car transmitter including power supply, $35; Subraco MT15X, $35; Collins 32V2, $375; Hi-Fi broadcast recvr rack mounting, $50. Contact Paul Reveal, 129 Midland Ave., Glen Ridge, N. J.

FOR Sale: Collins 310B3 complete with all coils and manual. Unmodified: $180 F.o.b. Crawfordsville, Ind. Marsh Jones, Jr., KR5.

WANTED: SX-25 or equivalent. State price, condition, etc. Lewis, Glanville, W9TRI, 2218 Center St., Northbrook, Ill.

PERFORATED aluminum sheet, .051, 5/64" OD holes, ¼" centrs $1.20 sq. ft.; cut to size. Send for listing on beams, aluminum tubing, etc. Radcliff's, 1720 No. Countyline, Fostoria, Ohio.

FOR Sale: 130-watt bandswitching xmittr, $110.00; SX-71 with speaker, $140. Will trade both for NC-183D and speaker. K2JZT, Adolph, RFD #2, Sherburne, N. Y.

FOR Sale: New and used Gonset two and six-meter Communicators, converters, tuners, etc. Also Gonset mobile gear. R. T. Graham, W1KTJ, Box 23, Stoneham, Mass.

FOR Sale: Lysco 600S Transmaster, P.P. 813 all-band c.w. final; HDVL 40-20 and 10 coils, 1500 volt 400 Ma. power supply, all in 6 ft. relay rack. Wired for break-in. Prefer cash & carry. Best offer over $225. Albert L. Godshall, W3SRE, 532 Chestnut St., Lansdale, Penna.

HEATHKIT and Johnson equipment wired and tested. Write MATT, 2322 So. 2nd Ave., No. Riverside, Ill.

ENGRAVING; Call letters white on black, 2" x 8", $1.50; Keychains 1" x 3", 50¢; also signs, trophies, placques, nameplates, panels, etc. Inquiries invited. "Cliff" Head, W2FKH, 343 Fayette St., Bridgeton, N. J.

FOR Sale: DX-100 transmitter: $125. Cannot operate. TVI troubles. Cannot ship. Norm Mills, K5AAU, Box 57, Valley View, Texas.

HARVEY-WELLS TBS50 xtal mike input, in perfect condx, including home-made power supply, 400 v. 200 Ma.: $70.00; PE103 home-made base, in good condx, $15.00; KME HF 10-15-20 converter 7 Mc. IF in gud condx, $35.00. Need enclosed cabinet 19" x 36", plate transformer giving approximately 1800 to 2000 VDC. Sale or trade arrangements can be made in Poughkeepsie, N. Y. or Boston or write W2DVZ/1, 28 Elizabeth Rd., Billerica, Mass.

POWER Supply: Driven by ½ hp, gas engine. New unit complete with spare parts, tools, gas can, 50 ft. output cable, and storage trunk. Output underrated at 500 VDC at 65 Ma. and 12.6 VDC at 860 Ma. $50. W3AEU, Ed Asbury, 7531 Tioga St., Pittsburgh 8, Penna.

SELL: HRO-7 receiver and coils, A, B, C, & D. In fine condx, $150. Two power supplies, complete: 1500-1000 volt 300 mills, 1250-1000 volt, 300 mills. $25.00 each. F.o.b. Electra, Texas. E. C. Sanders, 209 N. Wichita.

WANTED: DY-11, DY-17, Navy Type 23333 or other dynamotor for ART-13 or ATC-1, also control unit C-87 or 23330. W4NZY 119 No. Birchwood, Louisville, Ky.

FOR Sale: Collins KW-1 used only one year, practically new, $3000; 32V3 with low pass filter, used less than 10 hours, $550; SX88, almost brand new, $400; HRO-60, complete with all coils and crystal calibrator, $400; Elmac receiver with power supply, $110; 2 Johnson rotators with indicators, $225 each; special heavy duty 110 ft. Aermotor tower, $700; Telrex beams, 3-el. 10 m., 3-el. and 6-el. 15 m.; 3 el. and 6-el. 20-m; 20-el. 2-m, all at one-third off the cost. Many other items including cable, tubes, co-ax switches, relays, etc. K2HLB.

BARGAINS! Reconditioned! 90-day new set guarantee! S-38, $29.00; S-38C, $34.50; S-40B, $79.50; S-53A, $65.00; SX-71, $169.50; S-72, $59.00; S-76, $139.00; SX-62, $199.00; S-81, $32.50; S-82, $29.50; S-85, $89.00; SX-96, $224.50; NC-98, $119.50; NC-125, $129.50; HQ-129X, $169.00; VHF-152, $39.50; HF10-20, $39.50; PR-31, $29.50; Gonset Super-Six, $42.50; Messner EX, $39.50; HT-9, $139.00; HT-19, $229.00; 32V2, $450.00; 32V3, $595 (factory reconditioned); TBS-50, $59.50; TBS-50A, $69.50; Viking II plus VFO, $255.00; A54H, $100.00. Many more on hand. Send for complete list. Liberal budget terms. Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.

MAGAZINES Wanted! QST, 1948; January, May, June, July, August and October; 1949; February and April; 1952; January, February and March. Also all 12 issues complete for 1946 and 1947. Frank H. Tooker, Box T, Lakehurst, New Jersey.

KWS-1: In new condx for sale or swap for KW-1. WØSLC, Martin Failor, Rhodes, Iowa.

WILL sell my 75A4 or 75A3 and 32V3. Also have other receivers and mobile gear. WØUEV, Hansen, 4369 Barker Ave., Omaha, Nebr.

KILOWATT transmitter, AM-CW, VFO. All band complete transmitter. Calibrated bandswitching exciter uses 6AB7 osc., 6AG7 buffer, 6AG7 buffer-doubler, 6L6 doubler-amp., 807 final amp. Exciter well-designed and extremely stable. Final amplifier uses PP-813s in Class C. 6000v. transformer adequately provides for maximum permissible input. AM is a Marmax modulator KW-2 using Rothman screen grid modulation. Need money for school. First check for $300; pictures and schematic upon request. Paul J. Skinner, W9QXR, Asbury Hall, Northwestern University, 1830 Sherman Ave., Evanston, Ill.

FOR Sale: Collins 75A3 6 Kc mechanical filter, new, $15.00. W2SSC, Driscoll, 173 Florida St., Buffalo, N. Y.

FOR Sale: Viking I TVI-suppressed transmitter and Viking VFO, $200; NC183-D recvr and speaker in brand new condx, $300; D-104 mike, $10, all for $455 cash. Will deliver within 150 miles. Also BC-221 freq. standard with calib. book and power supply, $60. Russ Hawe, W6BSH, 1336 Castro Ct., Monterey, Calif.

FOR Sale: Hallicrafters SX-71 double conversion communications receiver, in excellent condition, with matching deluxe R42 speaker, all for only $158. Alan Kehr, W3UZF, 2064 Jenkintown Rd., Glenside, Pa.

10B SSB exciter, QT-1, 75/20 meter VFO, perfect $160. All excellent miscellaneous speakers, relays, cables, etc. Marcel Valois, Box, 488, Covington, La.

RUBBER stamp with your call letters, name and address: $1.50; stamp pad, 35¢; nameplates $1 and up. El Kay Stamps, Box 5-WT, Toledo 12, Ohio.

FOR Sale: One RCA inductor type 50A microphone, complete with cord and coupling, ideal for outdoor use: $35.00. Jack Borden, Station WGTH, Hartford, Conn. Contact any night after 6. Tel: JA 7-9131. Willing to bring mike over for exam. and test for local deal.

75A3 accessories: 6 Kc mechanical filter, 100 Kc xtal and NBFM adaptor, like new, $40.00; BC610, complete, 80-10 meters, in excellent condx, $450; Elmac AF67, mobile xmitter, like new condx, with all necessary accessories; 12 volt Carter dynamotor, relays, complete, $175. Freedman, GR 3-2242, W2ASI, 117 East 11th St., New York City 3, N. Y.

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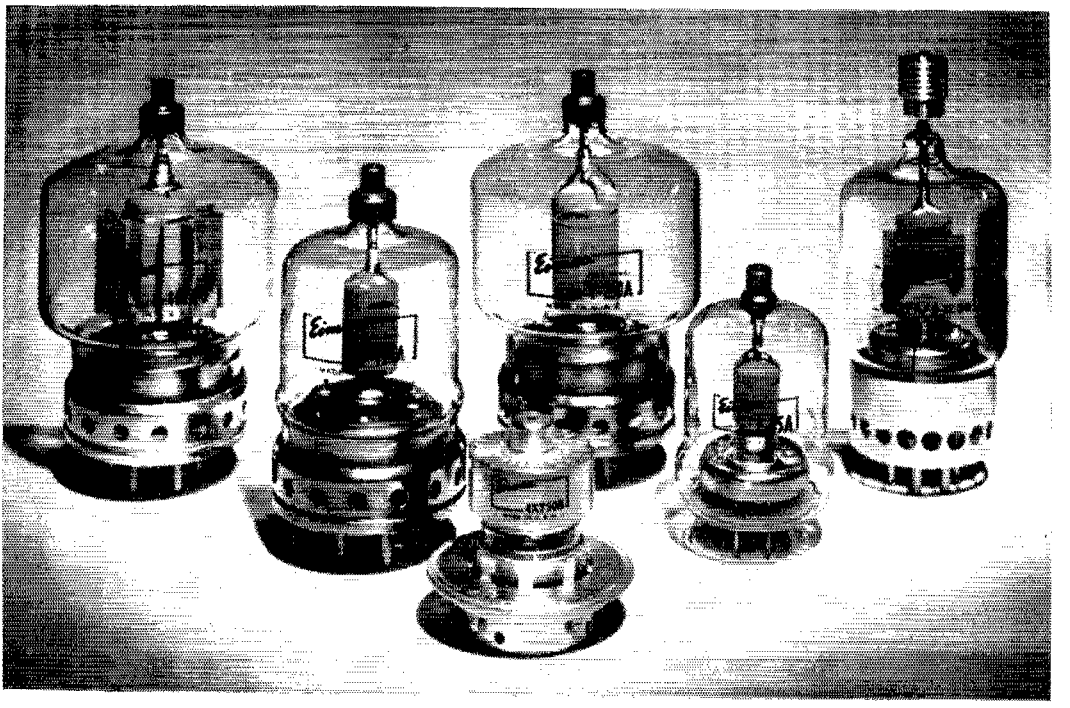

. . . with one of the EIMAC BIG SIX

The easiest way to build a powerful, all-band CW, AM or SSB transmitter is around an Eimac Big Six radial-beam power tube. A tube from this incomparable selection for ham radio service provides long range operating economy and simplifies initial circuit design. All except the output circuit can be built with common, low level receiver-type components. Driving power is so low that annoying TVI-producing harmonics generated in the exciter are readily controlled. Low feedback capacitances make stabilization of the amplifier stage simple.

Clean internal construction and ability to handle momentary overloads are among the many inherent traits of Eimac tubes that assure unmatched performance and reliability.

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BUY DIRECT AND SAVE: Knight-Kits give you the last word in Amateur design and value. They're easy to build from crystal-clear manuals, and the performance is unequalled. Save money—buy direct—get top quality with these Knight-Kits.

LOW COST knight-kit 50 WATT CW TRANSMITTER KIT

- Pi-Type Antenna Matching
- Bandswitching
- For 80 Through 10 Meters
- TVI Suppression

Model SX-255

$42.50

Built-in Pi-Type Antenna Coupler

Check the features packed into this new transmitter kit and you'll see why it's one of the greatest Amateur values ever offered. Compact and versatile, it is the perfect low-power rig for the beginning Novice or seasoned veteran. Features: 50 watts input to 807 final; high-efficiency 6AG7 modified-Pierce oscillator takes crystal or VFO without circuit changes; bandswitching coverage of 80, 40, 20, 15, 11-10 meters; pi-section antenna output matches line impedances from 50 to 1200 ohms—permits use with any type of antenna. Crisp, clean, cathode keying of oscillator and final. Power take-off plug supplies filament and B-plus voltages for other equipment. Copper-finished chassis and cabinet interior, filtering, shielding, bypassing, and coaxial SO-239 antenna connector provide excellent TVI suppression. Meter reads either plate or grid current of final. Jacks for VFO, crystal, and key. Supplied with all parts, tubes and step-by-step instructions. Less crystal and key. Size, 8⅛ x 11⅛ x 8¾". For 110-120 volts, 50-60 cycle AC. Shpg. wt., 18 lbs.

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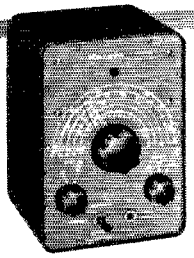

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SELF-POWERED VFO KIT

Model S-725

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Complete with built-in power supply! Careful design and voltage regulation assure high stability. Excellent oscillator keying characteristic for fast break-in with clicks or chirps negligible. Full TVI suppression. Has plenty of bandspread: separate calibrated scales for 80, 40, 20, 15, 11 and 10 meters; vernier drive mechanism. 2-chassis construction keeps heat from frequency determining circuits. Output cable plugs into crystal socket of transmitter. Output on 80 and 40 meters. With Spot-Off-Transmit switch for "no swish" tuning. Extra switch contacts for operating relays and other equipment. Complete kit for easy assembly. Shpg. wt., 8 lbs.

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An ideal new code practice oscillator. Uses transistor circuit. Extremely low current consumption—powered by single penlight battery. Provides crisp, clear tone (400 to 600 cps). Has input jack for earphone; screw-type terminal strip for key. In compact bakelite case (2⅝ x 3¾ x 1⅛") with anodized aluminum panel. Complete with all parts, battery and easy-to-follow instructions. Shpg. wt., 1 lb.

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Here is the first receiver in history specifically designed to include all the features most hams want at the price most hams are willing to pay.
To determine what hams really wanted, National conducted a world-wide contest, offering prizes for the best suggestions for a "dream receiver"—the receiver hams themselves considered to be ideal.
In the NC-300, "the dream comes true"—for its design incorporates all of the most-wanted features submitted in National's contest by thousands of hams.
No other receiver available is the result of such thorough searching among hams themselves to *find out* what they want most.

HERE IT IS!

the NEW **NC-300** *dream receiver*

WITH ALL THESE "MOST-WANTED" FEATURES *FOR ONLY* $369.95†

- Features a total of 10 dial scales for coverage of 160 to 1¼ meters with National's *exclusive* new converter provision with the receiver scales calibrated for 6, 2, 1¼ meters using a special 30-35 mc tunable IF band.
- Longest slide rule dial ever! Easily readable to 2 kc without interpolation up to 21.5 mc.
- 3 position IF selector—.5 kc, 3.5 kc, 8 kc—provides super selectivity, gives optimum band width for CW, phone, phone net or VHF operation.
- Separate linear detector for single sideband . . . decreases distortion by allowing AVC "on" with single sideband . . . will not block with RF gain full open.
- Hi-speed, smooth inertia tuning dial with 40 to 1 ratio! Provides easier, more accurate tuning. Smoothest dial you've ever used.
- Exclusive optional RF gain provision for best CW results allows independent control of IF gain.
- Big, easy to read, "S" meter.
- Provision for external control of RF gain automatically during transmitting periods.
- Muting provision for CW break-in operation.
- PLUS—THE NEWEST LOOK IN HAM RECEIVERS . . . "MASSIVE IN THE MODERN MANNER" . . . truly a "dream receiver" that can be used either as a table or rack model.

FREQUENCY STABILITY
excellent as a result of using a newly developed high-stability capacitor plus regulated heater and plate supplies in the oscillator.

SENSITIVITY
3-6 db noise figure, 160-10 meters

SELECTIVITY
at 6 db down 500 cycles, 3.5 kc and 8 kc. Selectable from the front panel without additional accessories! Nothing extra to buy!

CALIBRATION RESET
adjustable from front panel to provide exact frequency setting!

DUAL CONVERSION
with better than 50 db primary image rejection on all amateur bands, plus better than 60 db secondary image rejection.
1st IF FREQUENCY—2215 KC.
2nd IF FREQUENCY—80 KC.

WIDE RANGE TONE CONTROL
—for control of both low frequency and high frequency end of response curve!

SOCKET FOR XTAL CALIBRATOR
plus accessory socket for powering converters and future accessories!

CRYSTAL FILTER
at 2215 kc provides notching plus 3 band width positions in addition to the 3 IF selectivity positions. No other receiver has this versatility.

14 CONTROLS
RF gain and AC on/off
Xtal calibrator on/off
AF gain and RF tube gain switch
Tone control
AM-CW-SSB-ACC switch
CW pitch
Main tuning
Calibration correct
On/off limiter
IF selectivity
Xtal selectivity
Xtal phasing
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10 TUBES (Plus 4H4-C current regulator, 5Y3 rectifier and OB2 voltage regulator)

TUBE COMPLEMENT
6BZ6 RF
6BA7 1st mixer
6AH6 1st osc.
6BE6 2nd mixer
12AT7 1st audio and S meter amp.
6BJ6 1st I.F.
6BJ6 2nd I.F.
6AL5 ANL and detector
6BE6 CWO/SSB det.
6AQ5 audio output

POWER CONSUMPTION
60 watts

POWER OUTPUT
1 watt

POWER SOURCE
110-120 volts AC, 60 cycles

ANTENNA INPUT IMPEDANCE
50-300 ohms

OUTPUT IMPEDANCE
8 ohms

TUNING SYSTEM
combination gear-pinch

BAND DESIGNATION AND LENGTH

160 Meters—	1.8	to	2.0 megacycles
80 Meters—	3.5	to	4.0 megacycles
40 Meters—	7.0	to	7.3 megacycles
20 Meters—	14.0	to	14.4 megacycles
15 Meters—	21.0	to	21.5 megacycles
11 Meters—	26.5	to	27.5 megacycles
10 Meters—	28.0	to	29.7 megacycles
6 Meters—	49.5	to	54.5 megacycles*
2 Meters—	143.5	to	148.5 megacycles*
1¼ Meters—	220	to	225 megacycles*

*Usable with accessory converters

FREQUENCY RESPONSE
200 to 3,000 cycles for communications purposes.

SHIPPING WEIGHT
60 lbs.

FINISH
two-tone gray enamel.

DIMENSIONS
19½" wide (19" rack out of cabinet)
11¼" high
15" deep

NC-300 ACCESSORIES

CONVERTERS
NC-300C6 for 6 meter band. Coverage: 49.5-54.5 mc
NC-300C2 for 2 meter band. Coverage: 143.5-148.5 mc
NC-300C1 for 1¼ meter band. Coverage: 220-225 mc

XCU-300 PLUG-IN CRYSTAL CALIBRATOR
NC-300S MATCHING SPEAKER

tuned to tomorrow

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WHICH RCA TUBE FOR YOUR SSB "FINAL"?

RCA Tubes for RF Linear Amplifier Service (Single-Sideband)

RCA Type	Class of Operation	Max. Frequency for full Input Mc	Amplification Factor*	Heater (H) or Filament Volts	Typical Operating Conditions (Per Tube)							
					DC Plate Volts	DC Grid-No. 2 Volts	DC Grid-No. 1 Volts	Peak RF Grid-No. 1 Signal Volts	Zero-Signal DC Plate Current Ma.	Max. Signal DC Plate Current Ma.	Approx. Max.-Sig. Driving Power Watts	Approx. Max.-Sig. Power Output Watts
6AQ5	AB_1	60	10	6.3(H)	250	250	−15	15	35	40	—	5
6V6	AB_1	30	9	6.3(H)	285	285	−19	19	35	46	—	7
6N7	B	30	35	6.3(H)	300	—	0	82†	35	70	—	10
6L6	AB_1	30	8	6.3(H)	360	270	−22.5	22	44	66	—	13
	AB_2				360	270	−22.5	36	44	102	—	23
2E26	AB_1	125	6.5	6.3(H)	500	200	−25	25	9	45	—	15
	AB_2				500	125	−15	30	11	75	0.2	25
2E24	AB_2	125	7.5	6.3	500	125	−15	41	10	75	0.23	27
807 and 1625	AB_1	60	8	6.3(H)	750	300	−35	35	15	70	—	35
	AB_2			12.6(H)	750	300	−35	48	15	120	0.2	60
829-B	AB_1	200	9	6.3 12.6(H)	750	200	−21	42†	20	100	—	55
	AB_2				750	200	−19	50†	32	160	0.5	85
6524	AB_2	100	8.5	6.3(H)	600	200	−26	76†	21	135	0.1	57
832-A	AB_1	200	6.5	6.3 12.6(H)	750	150	−32	64†	24	120	—	60
6146 and 6159	AB_1	60	4.5	6.3(H)	750	195	−50	50	12	110	—	60
	AB_2			26.5(H)	750	165	−46	54	11	120	0.4	65
4-65A	AB_1	50	5	6.0	1750	500	−90	90	10	85	—	85
	AB_2				1800	250	−35	90	25	110	1	135
4-125A/ 4D21	AB_1	120	5.9	5.0	2500	600	−96	96	25	115	—	165
	AB_2				2500	350	−43	139	47	130	2.5	200
811-A	B	30	160	6.3	1500	—	−4.5	85	16	156	2.2	170
813	AB_1#	30	8.5	10.0	2500	750	−95	90	25	145	—	245
8000	B	30	16.5	10.0	2250	—	−130	280	33	225	4	360
4-250A/ 5D22	AB_1	75	5.1	5.0	3000	500	−93	93	60	205	—	370
	AB_2				3000	300	−53	100	62	236	4.5	520
833-A	B	30	35	10.0	3300	—	−80	190	60	300	20	710

#Grid No. 3 connected to filament center-tap. †Grid No. 1 to grid No. 1 signal voltage for push-pull operation.
*For beam power tubes and pentodes, the value shown is the Mu-Factor, Grid No. 2 to Grid No. 1.

The *right* RCA Tube for your single-sideband amplifier is listed in this chart. For the power you want, simply read down the column on the right. For the corresponding RCA Tube type, read the column on the left. When you make your choice—let the Typical Operating Conditions be your guide.

Known for their tremendous reserve of filament emission, RCA Tubes meet the requirements for single-sideband transmission—to the letter. They literally "loaf along" on the power peaks. And they have the power sensitivity it takes to build a signal up to full power in one stage—from low input signals. When you go SSB . . . any power from a few watts to the limit . . . remember, you can do it better *with RCA Tubes.*

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